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The Magazine

Spring 1992

Healing the Senses

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HEALING THE SENSES

Vision, hearing, touch, taste and smell. Our senses not only make life richer, but our very survival depends on our ability to respond to the information we get through them. According to the Guinness Book of World Records, the longest anyone has been able to withstand total deprivation of the senses is 92 hours.

Although considered separate entities—and often taken for granted—taste, smell, touch, vision and hearing work in concert, making up a vast, complex information system. Physicians and scientists at Rush are helping to unlock the body's network of sensory organs and receptors and finding new ways to treat people whose senses have failed them.

by Barbara Harfmann, Marie Mahoney, Carolyn Reed, Sue Jeantheau and Krys Kazieczko-Kuszak

Vision

There's one lesson from elementary school that few of us are likely to forget: Never, ever look directly at the sun during an eclipse. Exposure to concentrated infrared rays, even for seconds, can cause irreversible damage to the eye—possibly blindness.

It's ironic, then, that some of the greatest advances in eye care in recent years have been made possible by the laser, a tool that harnesses infrared light, as well as the potentially damaging ultraviolet portion of the spectrum.

"Lasers have brought us into a *Star Wars* revolution in the operating room," says William E. Deutsch, M.D., chairman and professor of ophthalmology at Rush.

Lasers generate extremely bright light and intense heat—up to a billion times hotter than the surface of the sun. But lasers heal, rather than harm, because their destructive powers can be precisely controlled and targeted.

Used as a scalpel, a laser can cut as finely as the width of a single cell. And because different parts of the eye absorb different colors of light, a laser can be tuned exactly to affect the targeted area without damaging surrounding tissue.

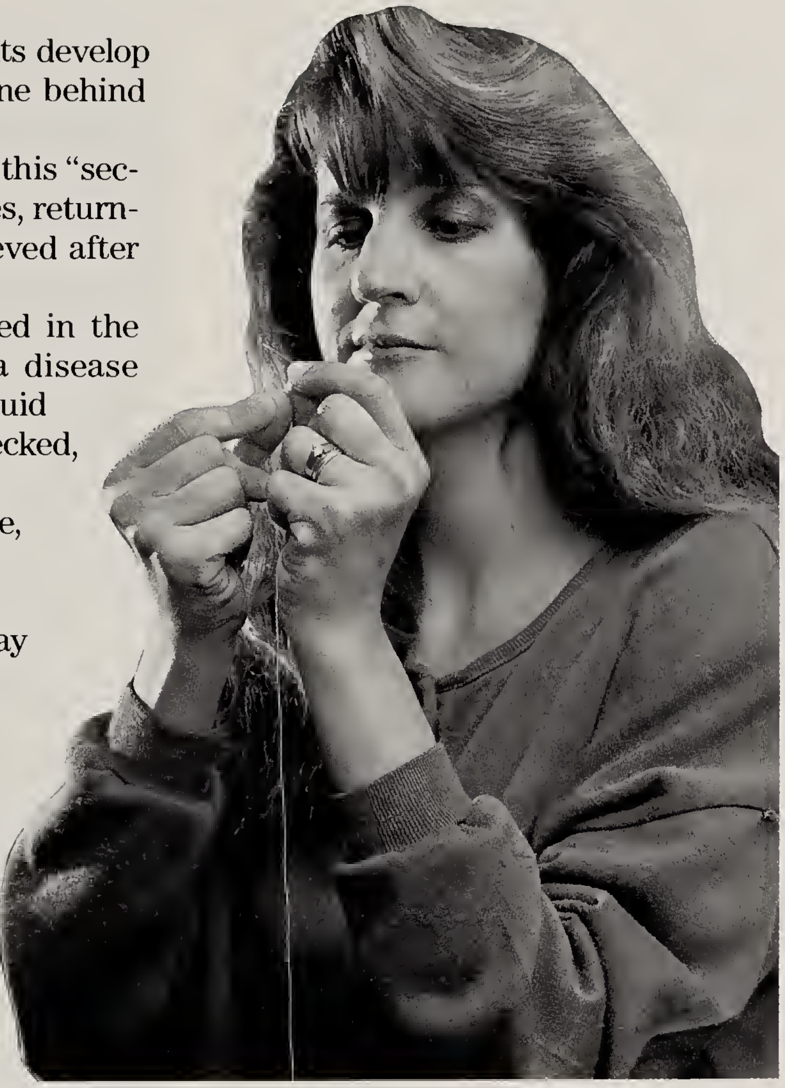
Lasers are powerful weapons against once untreatable diseases of the retina, the thin membrane lining the inner eye. They can destroy diseased tissue, seal leaky blood vessels and repair injuries caused by blows to the head.

Lasers restore sight in people who suffer a common complication of cataract surgery. Months, or even years, after a cataract—or clouded lens—has been replaced with an artificial one, about 50 percent of patients develop cloudiness in the membrane behind the new lens.

The laser blasts through this "secondary cataract" in minutes, returning sight to the level achieved after initial cataract removal.

Lasers have been enlisted in the fight against glaucoma, a disease marked by the buildup of fluid pressure in the eye. If unchecked, glaucoma causes blindness by destroying the optic nerve, the channel for messages from eye to brain.

Lasers can be used to delay or prevent the need for conventional surgery for some glaucoma patients. They work by creating holes to drain fluid or, in the most severe cases, by destroying the very cells that produce fluid in the first place.



Rush is the only academic medical center in Chicago to have access to a laser that may one day be the preferred tool for permanently correcting focusing errors in nearsighted people.

Cornea specialist Jeffrey Robin, M.D., associate professor of ophthalmology at Rush, is conducting clinical trials of the new excimer laser.

Correcting Eyesight

Nearsightedness is estimated to affect one in four Americans. In normal vision, light rays are bent by the cornea and lens and focused directly on the retina. In nearsightedness, distant objects are difficult to see because eyes are too long or corneas too steep, causing light to hit a focal point in front of the retina.

The problem is usually corrected with glasses or contact lenses, which move the focal point back to the retina by correcting the way light is bent. More recently, it has become possible to do this with a surgical technique called radial keratotomy.

With this method, the cornea is flattened with several thin, radial incisions using a fine scalpel.

The excimer laser achieves similar results by shining circular beams of ultraviolet light, in pulses as short as a billionth of a second, onto the exact center of the cornea.

"With each short pulse, we remove an extremely thin slice of tissue," says Dr. Robin. "We can usually resculpt the cornea in less than 30 seconds."

The laser can be more precisely controlled than the surgeon's knife. This may eliminate some of the problems with radial keratotomy—too little or too much correction of focusing errors, slight fluctuations in vision, and glare in night vision—that can result from inconsistencies in the depth and shape of surgical incisions.

"One of the rare complications of radial keratotomy is perforation of the cornea due to a cut that is too deep. Because the laser works right on the surface of the eye, we haven't seen these intraocular complications," says Dr. Robin.

Since the laser allows for variability in the size and shape of excisions, it

The excimer laser may one day challenge existing surgical procedures for correcting nearsightedness.

may one day be used to smooth corneal irregularities that cause the fuzzy vision associated with astigmatism. Investigators are also looking into using the laser to correct farsightedness.

The excimer laser is being used experimentally at 30 centers nationwide.

"We're awaiting approval from the Food and Drug Administration," says Dr. Robin. "We can't make any final proclamations about the procedure's safety or efficacy, but there haven't been any reports of potentially blinding complications.

"Over the next decade, laser technology may challenge, if not supplant, existing surgical techniques."

Research Advances

According to Dr. Deutsch, "Looking at progress in eye care, lasers are the most dramatic in a series of advances made possible by long-term research both in clinical settings and in the laboratory."

Rush retina specialists Kirk H. Packo, M.D., and Bruce R. Garretson, M.D., are studying an age-related condition called macular degeneration that is the leading cause of central vision loss in people over the age of 65.

The disease affects the macula, a small area in the center of the retina that is responsible for the straight-ahead vision—as opposed to side vision—needed to read a book, drive a car or thread a needle.

There are two forms of the disease. The so-called "dry" form is more common. "This condition, caused by degeneration of the retina and underlying pigmented tissue in the macular region, is extremely common with age," explains Dr. Garretson. "It may be gradually progressive and can lead to legal blindness.

"Right now, there is no treatment. We're focusing on ways to slow progress of the disease," he says. "We're involved in a multicenter study exploring whether we can help patients in the early stages of disease by giving them vitamin and mineral supplements."

Drs. Packo and Garretson have also been involved in a national collaborative study to determine the best treatment for the less common but more serious "wet" form of the disease.

This occurs when abnormal blood vessels grow underneath the retina and begin to leak blood. If vessels are not sealed, blindness may result.

In some cases, the disease can be treated with a laser. But it still recurs within a few years in up to half of those who receive treatment, and patients need ongoing follow up.

Says Dr. Garretson, "Our goal is to discover how to best use the laser to preserve vision and to limit the recurrence of this devastating disease."

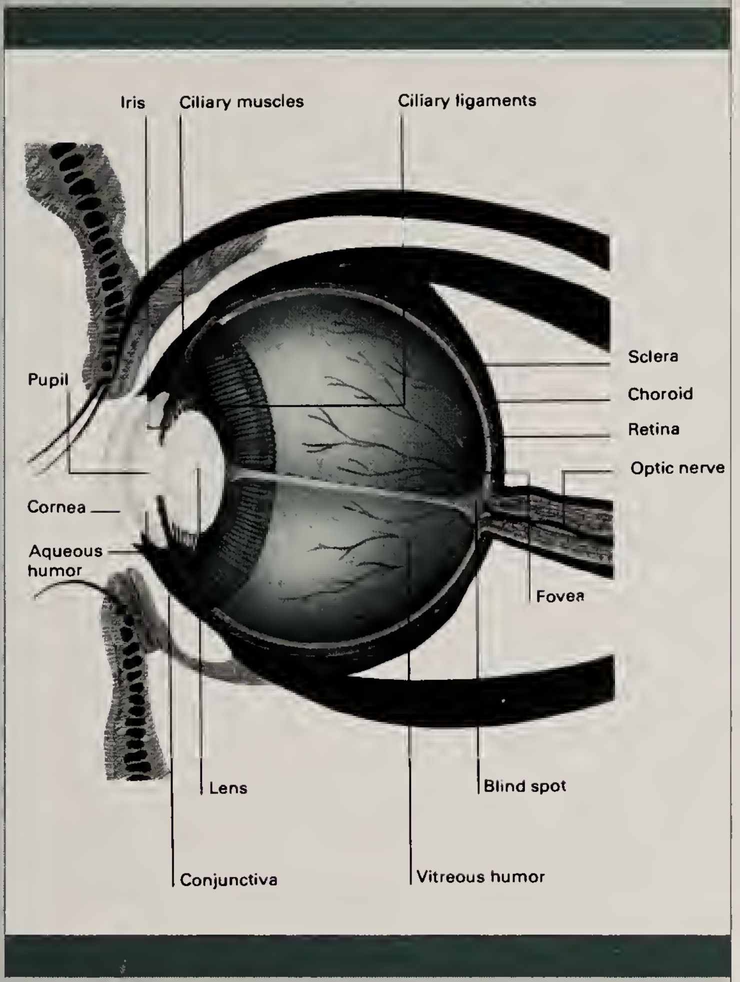
Research at Rush on how AIDS affects the eyes may lead to general insights about the relationship

Anyone who's ever used a camera should marvel at the ingenious natural model that inspired its design.

The transformation of light into sight begins as entering rays are focused by the cornea, the transparent window in the front of the eye. They then pass through a watery fluid behind the cornea, called the aqueous humor.

The amount of light that enters the eye is controlled by the iris, the colored part of the eye that lies directly behind the aqueous humor and acts as a shutter.

The iris is actually a ring of muscle with a central hole, the pupil. In dim light, the iris relaxes, widening the pupil to let more light in. In bright light it contracts to restrict light entry.



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The lens—a transparent, sphere-like body behind the iris—is responsible for the fine focusing of light. Muscles surrounding the lens push and pull to change its shape—making it shorter and fatter to view objects up close, and longer and thinner to see faraway objects.

From the lens, light passes through a thick jelly that fills the center of the eye. It's then projected onto the retina, a light-sensitive membrane that acts something like film in a camera. It contains special receptors that respond either to shades of black and white or to color.

These receptors send messages to the brain via the optic nerve, finally transforming light into a full-color picture.

between eye disease and systemic diseases like diabetes and hypertension.

Thomas A. Deutsch, M.D., associate professor of ophthalmology, is examining AIDS patients to explore the possible connection between the increased ability of their blood to clot and changes in the blood vessels in their eyes.

"AIDS leads to many changes in the eyes—some potentially blinding, some completely benign," says Dr. Deutsch. "But we're finding that even if they are otherwise healthy, the eyes of AIDS patients may exhibit changes in blood vessels similar to those seen in diabetic and hypertensive patients."

In those cases, researchers believe that eye problems are, at least in part, the result of blood that clots too rapidly. Their thinking is that blood may simply become too thick to flow freely through the retina.

Working with colleagues at Northwestern University, Dr. Deutsch is trying to determine whether something similar is happening with AIDS.

"We may be able to affect the ability of blood to clot and, as a result, reduce some of the complications of AIDS," says Dr. Deutsch. "But first we need to determine whether or not a high clotting mechanism affects vision and whether it can be controlled with medication."

Understanding Cataracts

In the laboratory, scientists at Rush are investigating the formation of cataracts—the number one cause of blindness in the world.

Cataracts occur when the normally transparent lens becomes opaque due to disease, injury or, most commonly, aging, says Jerome R. Kuszak, Ph.D., associate professor of ophthalmology and pathology.

Working primarily with primate lenses, Dr. Kuszak has discovered that in cortical cataracts—which start along the edges of the lens and gradually move toward the center—opacity is the result of irregularities in lens structure.

"The lens is a series of concentric shells. It is transparent, at least in part, because of the symmetrical arrangement of its uniform cells within each shell," says Dr. Kuszak.

Over time, the lens seems to lose its ability to produce cells of the proper structure, he says. Thus, the pattern of cell alignment is progressively altered, and the lens develops regions in the cortex (outer shells) where light can no longer reach the retina.

In ongoing research, Dr. Kuszak is finding that there is a connection between abnormal cell growth and the presence or absence of special chemical factors necessary for cells to develop properly.

"We still don't know whether the problem is an insufficient supply of these growth factors, a lack of cellular receptors for the factors, or a combination," he says.

Dr. Kuszak's research suggests promising new avenues for the treatment of cataracts.

"The treatment today is no treatment at all—the only option is to take out the lens," he says. "We're getting to the point where we would be able to detect an evolving cortical cataract.

"In the future, we may be able to intervene, possibly by increasing the supply of necessary growth factors in the eye," says Dr. Kuszak. "In this way, the formation of cortical cataracts could be delayed or even arrested."

Continuing Progress

Dr. William Deutsch, a faculty member at Rush for 35 years, says that he's seen tremendous progress in ophthalmology just over the course of his own career.

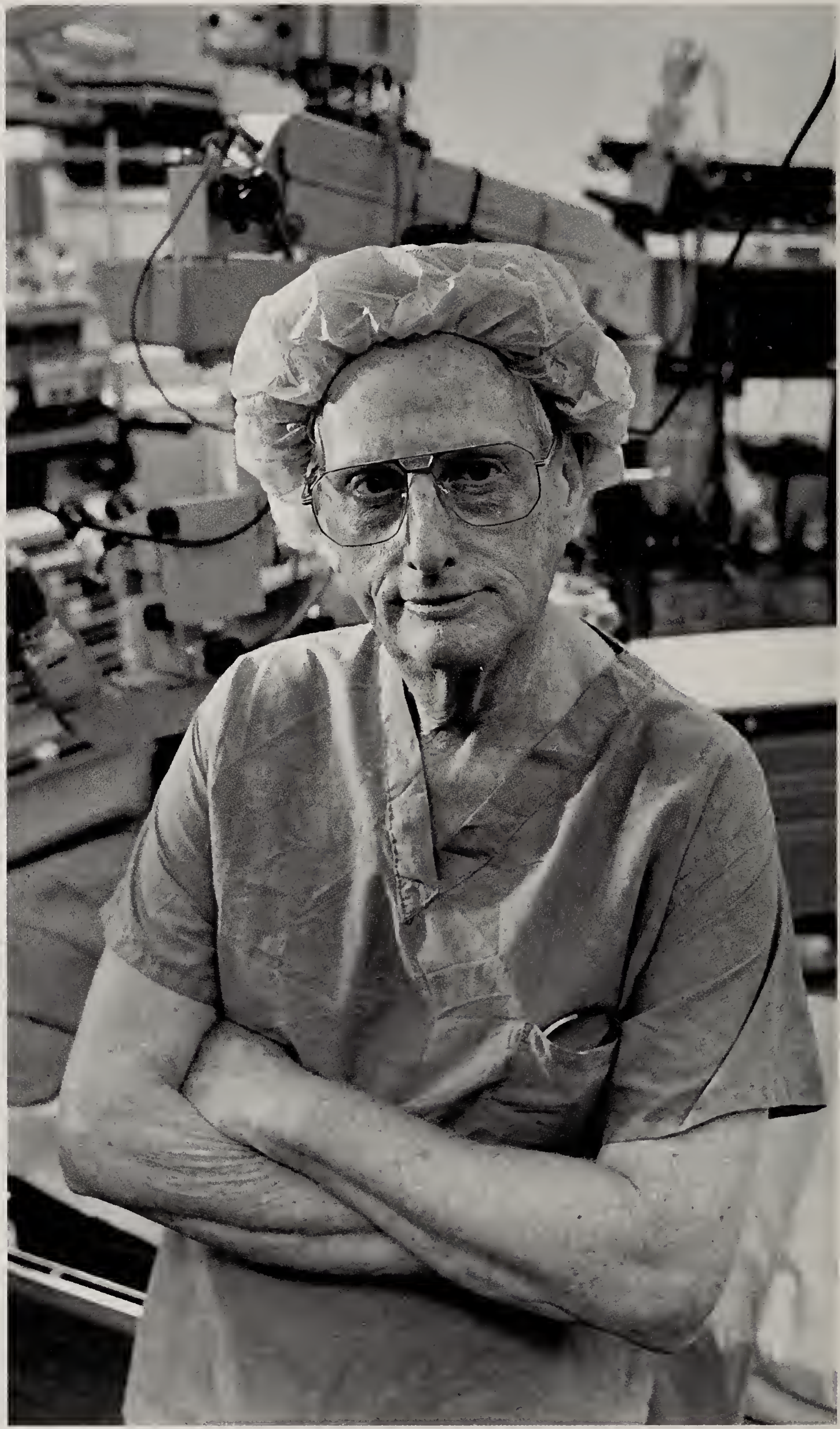
"The difference in the way cataract surgery is performed today compared to only a few years ago is a good case study," he says. Recent innovations—including finer suture material and miniaturized surgical instruments—have significantly reduced hospital stays and recovery time.

"In the past, surgeons removed the hard part of the lens as well as its supporting structure," says Dr. Deutsch. "After surgery, lens function would be taken over by thick 'coke bottle' spectacles and, later, by contact lenses.

"About 10 years or so ago, we began to insert an intraocular lens—which resembles a hard contact lens—into the eye at the time the cataract is removed. This is a routine procedure today.

"Fifty years ago cataract patients had to stay in bed for 10 days with sandbags over their eyes," he says. "Ten years ago, most people stayed in the hospital for three or four days. Seven years ago, they stayed in for one day. Today the procedure is done on an outpatient basis.

"This evolution is not just because of changes in technology but of changes in knowledge as well," says Dr. Deutsch. "Today, we know that the eye can recover in ways we simply weren't aware of 10 years ago. We've been able to alter our approach to the tremendous benefit of patients."—*B.H. and M.M.*



William E. Deutsch, M.D., chairman and professor, ophthalmology.

Hearing

The world is filled with sounds, many of them out of your control. Your ears are hearing all the time, even when you're not listening. They're always on. And they can and do wear out.

Hearing loss is on the increase in this country. An estimated 22 million people have some degree of hearing impairment. Sixty percent of people over 65 are affected. Increasingly, so are young children and younger adults.

"Some of us may begin to lose some of our hearing as early as in our 20s," notes Rush audiologist (hearing specialist) Jennifer Steele, M.A.

The hazards are many: genetic, environmental, chemical, viral, and just plain lack of common sense. What else explains why that commuter two rows in front of you has the Walkman on so loud you can hear the music from *his* headphones?

"While hearing loss has many causes, everyday noises play a significant role," says Steele.

Understanding how your ears "hear" can help you better protect this delicate sense organ.

Hearing is a brain response, triggered deep inside the ear. The entire ear structure—outer, middle and inner components—works in concert to make this happen.

Sound enters through the auricle, the external structure we commonly call our ear.

"Ever notice how some people cup the ear? That was the very first form of a hearing aid," notes David A. Klodd, Ph.D., associate professor of communication disorders and sciences at Rush. "The auricle's shape funnels sound into the ear canal and enhances it."

Once inside, this enhanced sound causes vibration of the tympanic membrane, the eardrum. The eardrum's shallow, convex surface enhances the sound even more as it passes into the middle ear.

Immediately behind the eardrum are three tiny bones—the hammer, anvil and stirrup—which together are called the ossicles. These bones move and transfer their movement through another membrane—the oval window—into the inner ear.

It is also in the middle ear that the eustachian tube connects the ear to the throat, thereby maintaining equal air pressure between the outer and middle ear (that's why swallowing or chewing gum can help you "pop" your ears on a plane).

This tube is particularly short and horizontal in infants and young children who often get ear infections as bacteria in the throat travels easily into the middle ear.

In the inner ear is the cochlea, with its fluid-filled semicircular canals, which regulate balance, and its coiling passages, called the labyrinth. In the cochlea, yet another transformation takes place. What was vibration becomes—in the presence of fluid—hydraulic energy. A fluid wave is created, which stimulates the organ of Corti in the cochlea.

Like a wave approaching a beach, this wave crests and at the same time excites the tiny hairlike sensory cells that line the organ of Corti. Hydraulic energy changes into an electrical impulse in the hair cells. That electrical impulse travels up the auditory nerve to the temporal lobe of the brain. And there, in the brain, you recognize you have *heard* something.

How long does all this take? Just a few milliseconds.

If any part of the ear structure is damaged, your hearing will be affected. If the inner ear is damaged, your sense of balance may be affected as well.

Catching Early Damage

Fortunately, many ear disorders can be corrected. Infections can be treated. A perforated eardrum can be repaired. Fluid buildup in the middle ear can be drained. Damaged ossicles (as in otosclerosis, a middle ear disorder in which the ossicles soften, then fuse) can be replaced.

These are problems that interfere with how the sound is conducted. Conductive hearing loss is usually treatable.

But if the problem is in the inner ear, where the sensitive hair cells and auditory nerve reside, there is no medical or surgical cure. This sensorineural hearing loss is usually permanent—the challenge is to live with it.

Relatively few people are totally deaf. Most people who are "hearing impaired" have a mild to moderate hearing loss. In young children, it may first become evident as they begin to talk.

Marsha Bonsonto remembers when her son, Michael, first started talking at age two. "It was so garbled. No one could understand him. Not even me.

My family tried to reassure me, saying he'd grow out of it. But months went by and it didn't get better so I went to the doctor and said, 'Something isn't right.'"

It wasn't. By the age of three, Michael was diagnosed with a mild to moderate sensorineural hearing loss in both ears.

"Our ability to hear is fundamental to how we learn to communicate," says Dianne Meyer, Ph.D., chairman, communication disorders and sciences at Rush. "Long before a baby begins trying to talk, he hears those around him talking, and the groundwork for language is laid."

Your hearing also provides feedback on how your speech sounds.

"When you talk you're constantly monitoring yourself, modifying your words and evaluating how you sound," says Rush speech-language pathologist Mary Bacon, M.A., associate professor, communication disorders and sciences. "People who are hearing impaired can't monitor so effectively. That's why speech therapy may help."

Michael now wears a hearing aid in each ear, and receives 45 minutes of speech therapy twice a week. The therapy has helped clarify his speech.

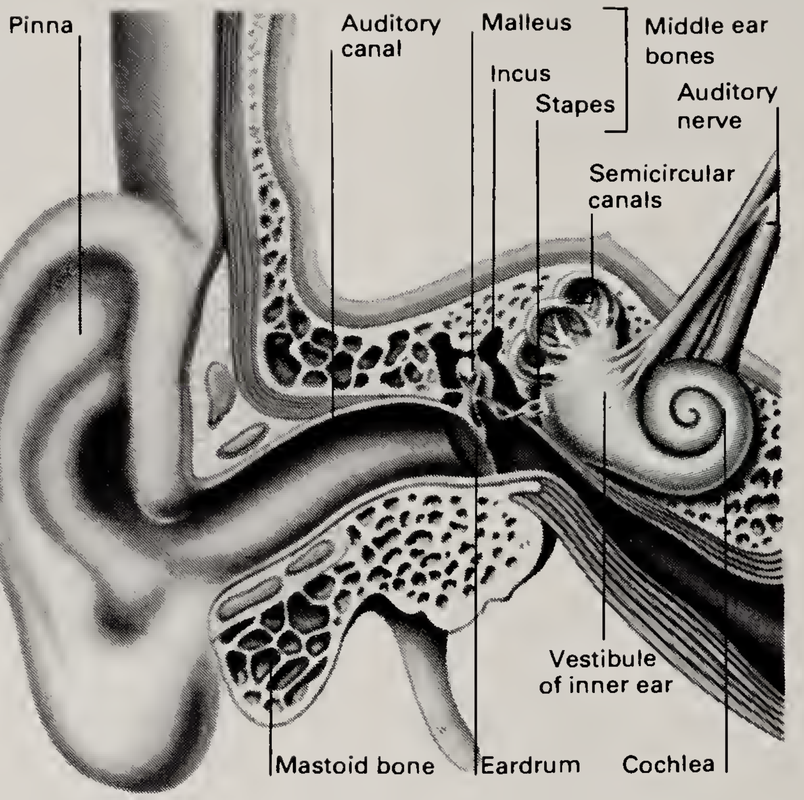
"He hated his hearing aids at first, but now it's like wearing shoes," says his mother. "I'm a little concerned that when he starts kindergarten next fall, kids will make fun of him. But already he is a very confident little boy, and everyone can understand him just fine."

New Technology

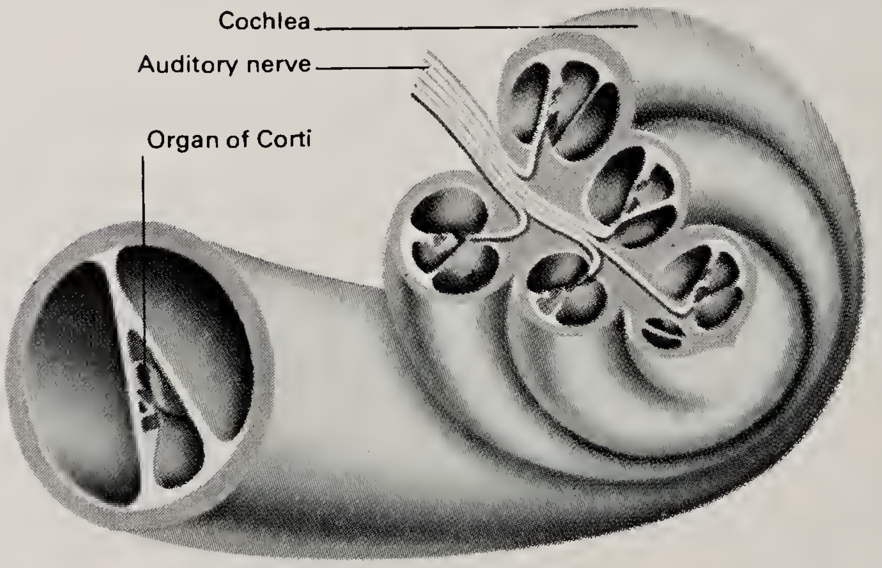
Until recently, the stigma of hearing loss was very real for people of all ages. "I think part of it was the fact the hearing aids were ugly," says Rush otolaryngologist Paul Jones, M.D. "And they really didn't work very well. But in the last 10 years, the technology has improved tremendously."

Microchip technology has revolutionized hearing aids. The newest and most expensive ones are tiny enough to fit inside the ear canal, and their high-tech circuitry makes them much more versatile.

"A hearing aid is essentially an amplifier. And, until recently, it amplified



Sounds received by the ear's pinna (auricle) pass along the auditory canal to the eardrum. Vibrations are carried by three bones to the cochlea, from which nerve impulses are sent to the brain.



The spiral cochlea is divided internally into three compartments. In the central section is the organ of Corti, with hairs that vibrate in response to sounds. This creates nerve impulses that travel to the brain for analysis.

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Dianne Meyer, Ph.D. (right), shows students how real ear measurements are taken, using a probe microphone inserted into the ear canal. In patients, the probe measures hearing aid output.

everything," says Dr. Klodd. "But the newest aids can be programmed to amplify only the range of sounds the wearer can't hear. They can also be programmed to minimize background noises."

By having up to three circuits, these hearing aids can be worn in a variety of sound settings without readjustment.

The cochlear implant is a specialized device for people who are completely deaf. It has been available for adults since 1985. The Food and Drug Administration recently approved the implant for children.

It functions not as an amplifier, but more like a radio. A titanium electrode receiver is implanted surgically in the cochlea, where it stimulates the auditory nerve.

The wire implant is attached to a transmitter embedded under the skin, behind the ear. Sound is processed by a third component, worn on the patient's chest, which sends electrical signals to the implant via the transmitter.

A cochlear implant can cost up to $30,000. Patients must also have about two years of intensive aural rehabilitation therapy to learn how to interpret the electrical sounds the implant generates.

"As the population ages and more people wear hearing aids, it will be like wearing glasses—no big deal," says Dr. Jones.

Too Much Noise

Hearing loss in older people is usually tied to aging. There's even a specific term for it—presbycusis. As people age, physical changes in the hair cells and the auditory nerve alter ability to hear. But there's a growing belief that some hearing loss associated with aging is actually caused by prolonged exposure to too much noise.

"We live in a very noisy society," says Dr. Klodd. Many professions are noisy—dentistry, music, trucking, construction. We listen to loud music, attend loud sporting events and have noisy hobbies like snowmobiling, motorboating and motorcycling. At home, vacuum cleaners, hair dryers, blenders, mixers, lawnmowers, snowblowers and stereo systems all take their toll.

Noise-induced hearing impairment can be prevented or minimized if more people recognize the vulnerability of their hearing.

"You know you've been exposed to too much noise for too long when your ears ring afterwards," says Dr. Klodd. "Some people describe a sense of fullness in their ears. It's usually temporary, but over time such exposure will damage your hearing."

One of the early signs of noise-induced hearing loss is chronic ringing or buzzing in the ear, called tinnitus.

Forty-two-year-old Gary Kaplan has tinnitus in his left ear. For more than 12 years he traded pork bellies Monday through Friday at the Chicago Mercantile Exchange. He has retired from active trading because the noise aggravates his tinnitus.

"Noise hurts. Now I avoid it at all cost. I don't think I've seen a basketball game in five or six years. And I carry large earplugs with me at all times," he says.

Sound is measured by loudness—decibels—and by pitch—frequency. While a high-pitched sound may seem uncomfortable, loudness is the critical factor when it comes to protecting your hearing.

"The ear is marvelously adaptable so you don't always realize you're assaulting yourself with too much noise," says Dr. Jones.

"My rule of thumb is, if you can't have a normal conversation, the environment you're in is too loud."

Ordinary conversation falls between 45 and 65 decibels. A busy city street or loud headset might register 80 decibels. Subway trains can generate 100. Anything over 85 can cause hearing damage, including temporary deafness. Exposure to noise over 125 decibels (like a jet taking off when you're standing near it) can cause permanent deafness.

What chronic noise exposure does is damage the delicate hair cells of the inner ear. These hair cells can't be repaired or replaced.

The Occupational Health and Safety Administration (OSHA) says workers who are routinely exposed to sounds of 85 decibels or more must be provided protective gear for their ears.

What's less clear is the danger in sporadic or brief noise exposure, over time. You don't see many rock musicians or daily subway riders wearing ear protection. But some would argue they should.

Other threats to the hair cells, besides noise, are certain medications, particularly antibiotics, aspirin and some anticancer drugs, as well as certain bacterial and viral illnesses. A severe case of bacterial meningitis can cause deafness.

Premature infants are particularly at risk for hearing loss. Babies in the Special Care Nursery at Rush are regularly evaluated to identify hearing loss early so that treatment and/or intervention can begin.

"Low birth weight—below 1,500 grams or two pounds—is a major risk factor, since these babies generally have many medical problems," says Rush audiologist Sally Kolmodin, M.S., instructor, communication disorders and sciences. "Some have birth defects or have been exposed to viral infections or drugs prenatally, which increases their risk for hearing loss."

Screening the hearing of infants less than two years old is possible because of a highly selective form of EEG (electroencephalogram) which measures the responsiveness of the auditory nerve. The test, done while the baby is sleeping, is called an ABR, auditory brainstem response. It shows whether sound delivered into the baby's ear is being picked up by the auditory nerve.

The ABR can determine the degree and type of hearing loss, says Dr. Meyer.

> ***"If you can't have a normal conversation, the environment you're in is too loud."***

Hearing loss due to an ear infection or a physical malformation of the ear can often be treated.

"If the baby has sensorineural hearing loss, however, the task for us is to begin audiologic management and help the parents deal with their child's hearing loss.

"The child is fitted with hearing aids as soon as possible. We teach the parents about speech and language development and how they can stimulate their child. And we refer them to special parent-infant programs for the hearing impaired."

New Discoveries

But it may not be too distant in the future when medical treatment of sensorineural hearing loss becomes a reality.

Scientists studying the workings of the inner ear are making headway. Recently, something new and unexpected was discovered: the Kemp echo, named for the English researcher who first detected it.

The Kemp echo is an otoacoustic emission, a sound produced by the ear itself.

"We have long assumed that the inner ear is just a microphone, responding as it converts vibratory energy into electrical energy," says Dr. Meyer. "But now it appears our auditory system may generate some type of positive feedback."

Researchers have described these emissions as analogous to the eye giving off light or the nose giving off an odor. What's more, an impaired ear gives off no emission, so the finding may lead to a simpler screening method to detect hearing loss in infants.

"Otoacoustic emissions are giving us a greater understanding of the complexities of human hearing. Ultimately they may help us understand how the ear is so remarkably sensitive to changes in sound," says Dr. Meyer.

Yet another recent discovery has occurred in studies of hair cell physiology. Though thought to be irreparable, hair cells have shown an ability to regenerate in birds. This finding seems to fit with certain clinical observations.

"We occasionally see patients with sensorineural hearing loss that fluctuates or even recovers," says Dr. Meyer. "We've never really understood why this is so."

These animal studies may hold the key to understanding how damaged hair cells might be regenerated and ultimately lead to medical treatments for sensorineural hearing loss.

But in the meantime, perhaps the best way to prevent or minimize hearing loss is to take precautions, avoid excessive noise exposure, and don't hesitate to have an ear or hearing problem checked out promptly by a specialist.

"No other part of our body deteriorates so dramatically as we age," notes Dr. Jones. "So when I see a younger patient, I stress how important it is to protect your hearing, that there's a lot of noise pollution out there, but much hearing loss is preventable.

"I also share with them what my older patients tell me. They say how much they miss being able to hear well."—*C.R.*

Smell and Taste

Tasty? Thank your sense of smell.

The aroma of autumn spices may tingle the nose with familiar scents. Yet, beyond mere recognition of cloves, cinnamon and nutmeg, you may also recall past Thanksgiving dinners and family trips to the pumpkin farm.

All this from a sniff?

"We make strong associations between odors and events. Smell is very much a sensation that works on a subconscious level," says Rush psychiatrist and neurologist Alan R. Hirsch, M.D.

Our sense of smell is the only sense that directly reaches the "thinking" part of the brain, the cerebrum. Messages from our other senses are sent through the thalamus, the brain's relay station, before being forwarded to the cerebrum. Direct access to the brain explains the ability of our sense of smell to influence the limbic system, which controls our emotions, moods and memories.

Besides its connection to the brain, the sense of smell also has an important link to the sense of taste.

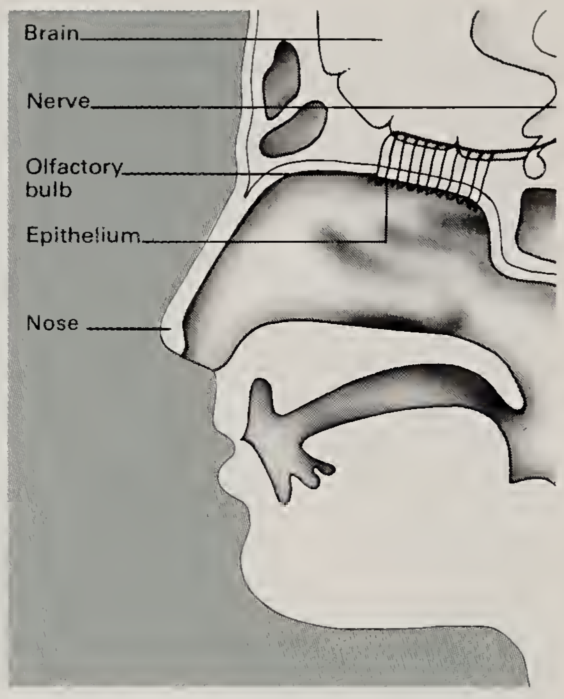
"About 90 percent of what we call taste or flavor is really our sense of smell at work. If you lost your sense of taste, you probably wouldn't notice it," says Dr. Hirsch, who directs the Smell and Taste Treatment and Research Foundation, one of five such centers in the country.

Hold your nose and eat some chocolate. Or, with your nose and eyes closed, alternate eating an apple and an onion. You probably wouldn't recognize any of these tastes. Open your nose again, and suddenly food "tastes" more familiar.

The Nose Knows

Smell enhances taste, creating the many flavors that we sense. In school, we learned about the four tastes: sweet, sour, salt and bitter. But research shows that we have a much more discerning palate. We can differentiate as many as 100 other distinctive tastes ranging from nicotine to umami, a horseradish that seasons sushi.

In our taste primer, we also learned the theory about perceiving the four tastes on specific areas of our tongue. But researchers tell us that our taste buds are more sophisticated. Sweetness isn't just tasted on the tip of the tongue, nor bitterness on the back. Indeed, the taste receptor cells in our hundreds of taste buds—found throughout the mouth, and especially on the tongue—can each recognize distinct tastes.



Smell stimuli enter the nose through the olfactory bulb up to the brain.

From *The World Book • Rush-Presbyterian-St. Luke's Medical Center • Medical Encyclopedia.* © 1991 World Book, Inc. By permission of the publisher.

But, if we "overload" our taste buds, we can lose some sense of taste. Regularly shaking salt on our dinner may cause our taste buds to slowly lose sensitivity to the seasoning.

"If you have a diet high in salt, the tongue's receptors will adapt to that level of salt and, in a way, grow numb. It will be harder for you to detect salt in what you eat, so you'll use more just to taste it," says Dr. Hirsch.

Overall, taste is more of a physical sensation than a chemical one. It's an amalgamated perception created by consistency, texture, temperature, visual appeal and, most of all, smell.

Though the sensory tissue in our nasal passages is only about the size of a postage stamp, the impact of our sense of smell is not so small. We can detect an odor even after it has been diluted billions or trillions of times.

Yet, we can eliminate the odor we smell simply by opening our mouths.

As we inhale air, we take in odor molecules. The molecules rush to the back of the nose where they reach two mucous membranes. The tissues contain wavy hairlike protrusions called cilia, which are receptor nerve cells.

The cilia's special proteins guide the odor molecules to designated spaces where they fit into the cilia like a hand in a glove. Each odor has its own address, so to speak, and the molecule has just come home.

Once the molecule meets its cilia, a neurotransmitter fires an energy message up the olfactory (smell) nerves to the olfactory bulb in the brain. Here, the message is processed, and the odor is detected and identified.

But sometimes something goes wrong, and our ability to smell changes. We may experience a reduced or complete loss of ability to smell. We may have a heightened sense of smell. We may even have to cope with odd smells from unknown sources. Almost four million people in the United States suffer from some type of smell and taste disorder. For 200,000 of them, it's severe enough to seek medical treatment.

Loss of smell, or anosmia, is one of the more common problems. Anosmia can result from head injury, vitamin deficiency or nasal blockage. Even a simple cold can knock out our sense of smell. Not all damage is permanent. About 40 percent of the time, the sense does eventually return.

Restoring Smell

Researchers are testing medications that may help to restore loss. These drugs are typically used for neurologic and psychiatric illnesses, such as amitriptyline, an antidepressant; amantidine, a Parkinson's disease medication; Ritalin, used for hyperactivity in children; and theophylline, used for asthma.

These medications substitute for malfunctioning neurotransmitters that have stopped sending messages to the brain. The drugs may improve the ability of the olfactory nerves to send smell messages and revive the sense.

Medications worked for Sandy Kehrein of Carol Stream, Illinois, a patient of Dr. Hirsch.

"I was eating pancakes for breakfast one morning and the syrup tasted flat. In two days, everything tasted bad," Kehrein recalls.

The bad taste led her to stop eating and drinking. She lost 25 pounds over several weeks and twice was taken to the emergency room for dehydration.

"I tried to eat because I was so hungry. But everything tasted so awful that I just pushed it away. Pop tasted like acid," she says.

Although she still has episodes of a soapy taste in her mouth, medications have helped reduce them to just one or two a day.

It's been 15 years since Karen Bauman first noticed a problem with her sense of smell.

A rancid, garbagelike odor of unknown origin breezes through one of her nostrils six to eight times a day. By the time she found some relief, she had consulted 14 different specialists, including ear, nose and throat doctors, as well as allergists, neurologists and psychiatrists. At one point she even considered brain surgery to remove her olfactory bulb.

"This is a problem that has completely taken over my life," says Bauman. "It affects all of the things in life that make me human—everything that gives me pleasure."

Initially, in her frustration with the lingering stench, Bauman violently threw her head against a mattress and cried uncontrollably. She was surprised when these measures brought temporary relief. Now her treatment comes from anticonvulsant drugs and a water-dampened cotton ball placed in the affected nostril, which enables her to endure eating.

"This is a 'pressure sensitive' condition," Dr. Hirsch explains. "Changes in nasal air pressure cause the olfactory nerves to emit an abnormal discharge. By altering the pressure, such as by plugging a nostril, a patient can control the odor."

A smell or taste deficiency is unsettling, but it's likely something most of us will experience at least to some degree as we grow older. That explains why Grandma, who can't smell her perfume anymore, douses herself with it until she can.

In fact, more than 80 percent of people over age 80 have problems with

"Pop tasted like acid," says Sandy Kehrein of her smell disorder treated by Alan R. Hirsch, M.D.

sense of smell. There are several reasons why.

"With aging, even though the nasal system still functions, the neurotransmitters in the brain do not fire as effectively. Our general ability to remember and form associations diminishes," explains Dr. Hirsch. "Also, arthritis can strike the cribriform plate—the strip of bone through which the olfactory nerves pass on to the brain. That can constrict the olfactory nerves and inhibit message transmission."

Losing sense of smell can set off a chain reaction leading to serious health problems.

"When elderly patients have trouble with their diets or just don't care whether they eat, I think much of this has to do with their lack of enjoyment because they can't taste things. And they can't taste things because their sense of smell is gone," says Rush geriatric specialist Jack Bulmash, M.D., assistant professor of internal medicine.

An 80-year-old man who cannot smell or taste his food may not know when it has spoiled. His impairment can even prevent him from sensing a gas leak or a fire, and that could lead to disaster. Utility companies put noxious-smelling ethyl mercaptan into cooking gas as a sign that gas is present, yet 15 percent of people older than 70 cannot smell the odor.

"I think finding a way to prevent or reverse smelling disorders will help us improve the quality of life for elderly people and prevent accidental deaths," says Dr. Bulmash.

Smell and Taste Research

Investigators are just beginning their exploration of these senses. As Dr. Hirsch often notes, "Where we are with smell and taste research is where the ophthalmologists were when they developed the E chart for vision."

Because messages travel to the brain, understanding how our sense of smell works may open a window to our unconscious. It may also suggest new treatments for myriad ailments and conditions.

A recent study found that heliotropin, a vanillalike scent, helped to relieve anxiety of patients required to lie still for up to an hour in the confines of a magnetic resonance imaging chamber. Now Dr. Hirsch is using heliotropin and a green apple-spice odor to see if there is a similar effect on patients suffering from the chronic worrying and nervousness of generalized anxiety disorder.

"If anxiety disorder patients respond

well to these odors, they may not require as much tranquilizer, like Valium," says Dr. Hirsch.

Researchers are also studying how aroma affects appetite and weight. In the same way our sense of smell reaches the limbic system and our moods and memories, it also accesses the satiety center that controls appetite.

Ever spend the day cooking only to realize that by mealtime you weren't hungry? That's because your brain interpreted the intake of smell as equal to intake of food, making you feel full when you hadn't eaten anything.

Eating disorders counselors encourage their patients to eat slowly and enjoy the smell and taste of their food so they won't eat as much at meals.

"Physiologically, it takes about 20 minutes for our satiety center to measure what we've eaten. If we gobble our food, we may still feel hungry because our brain hasn't perceived that we've eaten yet, and we'll eat more," says Nadine Grissett, Ph.D., assistant professor of psychology and social sciences at Rush.

The smell of certain foods may trip an emotional response that leads a person to eat poorly. A person who equates the delicious smells of a bakery with the nurturance and comfort of mom's kitchen may wolf down a pastry without being hungry.

Likewise, those who are angry, anxious or depressed, particularly obese or bulimic patients, may turn to food for relief.

"The smell of foods that are sweet, high in fat or fried may encourage these people to respond to their fear or anxiety by eating rather than by thinking about their problems," says Dr. Grissett.

Perhaps we can even smell ourselves out of eating more than we want, suggests Dr. Hirsch. He has designed a new study based on case results showing that people exposed to a chemical with the smell of potato chips lost their appetites and reduced their weight.

Diagnosing Illness

Ability or lack of ability to smell also may be useful as a diagnostic tool. A patient's ability to smell may help physicians determine onset or severity of certain diseases or conditions, particularly illnesses linked with neurotransmitter failure or dysfunction.

Olfactory impairment can accompany Alzheimer's disease, Parkinson's disease and other diseases with dementia. The neurotransmitter failure scientists associate with these diseases may well be tied to anosmia.

Migraines may also be associated with loss of smell. Migraine symptoms, such as changes in cerebral blood flow, teary eyes, runny nose and throbbing pain, may all contribute to the sufferer's loss of smell. Conversely, migraine-inducing odors, like cigarette smoke, perfume and paint, may go undetected by those with smell deficiencies, yet still affect the brain and lead to a headache. A third relationship theory concerns the migraine's emotional elements.

"The neurotransmitter abnormalities of migraines and olfactory loss may be related. Since we often see an emotional component to these headaches, such as blushing or red-colored ears, the implication is that the limbic system is associated with migraines," says Dr. Hirsch.

In another line of research, Dr. Hirsch is trying to pinpoint odors to use as markers for certain ailments. He has found that patients whom he diagnosed as being depressed also had difficulty detecting phenylethyl phenol, a chemical that smells like scallops. The less depressed patients were, the better they could smell it. A larger study with diagnosed depression patients will try to confirm whether this smell test detects depression.

Dr. Hirsch is also investigating the

Basic tests for smell and taste diagnose sensory disorders or other illness.

potential of an odor to indicate a woman's time of ovulation. Since a woman's sense of smell is keenest at ovulation, her ability to smell an indicator odor could substitute for temperature-taking as a home fertility test.

The more we discover about smell and taste, the more we discover about us—our style of living, our changing health, and our perceptions, moods and memories. And the applications for research in this area should keep experts nosing for answers in their quest to taste success and uncover the mysteries of these two senses.—*S.J.*

Touch

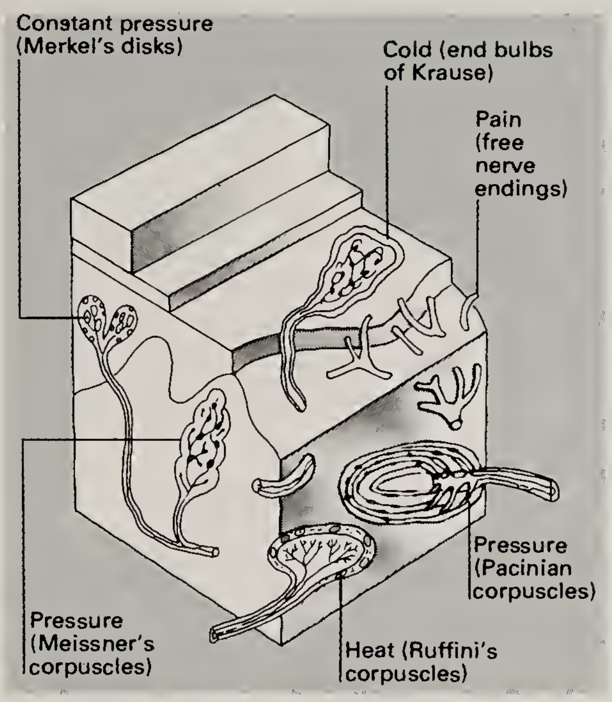
Numbing, tingling, burning sensations. A feeling of needles and pins or ants crawling under your skin. Shooting pain, weakness or loss of reflexes. What could be the cause?

When the sense of touch goes awry, the causes are many and the treatments growing in number.

The sense of touch is activated by tiny receptors in the skin that pick up sensations of heat, cold, vibration, light touch and firm pressure. They number in the millions and are scattered all over the body, but are particularly concentrated in the hands and fingertips.

With touch, the receptor is triggered and a signal is sent up a nerve, into the spinal column and then up to the brain.

"Problems with sensations could be due to damage of the receptors, but more often it is actual damage to the nerve itself," says Rush neurologist Russell Glantz, M.D.


Constant pressure (Merkel's disks)
Cold (end bulbs of Krause)
Pain (free nerve endings)
Pressure (Pacinian corpuscles)
Pressure (Meissner's corpuscles)
Heat (Ruffini's corpuscles)

The sense of touch involves specialized nerves (seen here in a cut-away view of a section of skin), which relay touch sensations to the brain.

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With degeneration of the nerve, early signs often appear in what is called a "stocking and glove" pattern, first affecting the feet, then the hands, the points farthest from the spinal column. As Dr. Glantz explains, "The farthest tributary of a river will be the first to dry up. Very frequently this is what we see in diabetic neuropathy, with tingling first in the feet."

Sensation gradually diminishes. Scalding bath water may not be perceived as hot at all, resulting in a burn. A cut on the foot will easily go unnoticed, even to the point that it has developed into an oozing ulcer. Sometimes there are abnormal, even painful, sensations. The person with diabetes may complain, "I feel like I'm walking on rocks."

The first step in treatment is getting the diabetes under control, although that may not stop the progression of nerve damage. A relatively new medication for the abnormal sensations and pain is a cream that contains the active ingredient of chili peppers.

According to Rush neurologist Robert B. Wright, M.D., this ingredient releases what is called Substance P, a naturally occurring chemical in the body that affects how we perceive pain.

"Used two to three times a day, the cream at first creates a feeling of warmth, a toned-down version of the burning sensation you feel in your mouth as you bite into a chili pepper. As it gradually releases the Substance P, you no longer feel the pain," he says.

Diabetes is only one of a number of conditions that can have a widespread, diffuse affect on the sense of touch. Cancer and even some cancer treatments are other known causes. Certain medications are known to cause changes. Alcoholism is a risk. A more and more common cause is the human immunodeficiency virus.

Sometimes the changes are due to abnormal proteins in the blood, which can now be washed away with a technique called plasmapheresis.

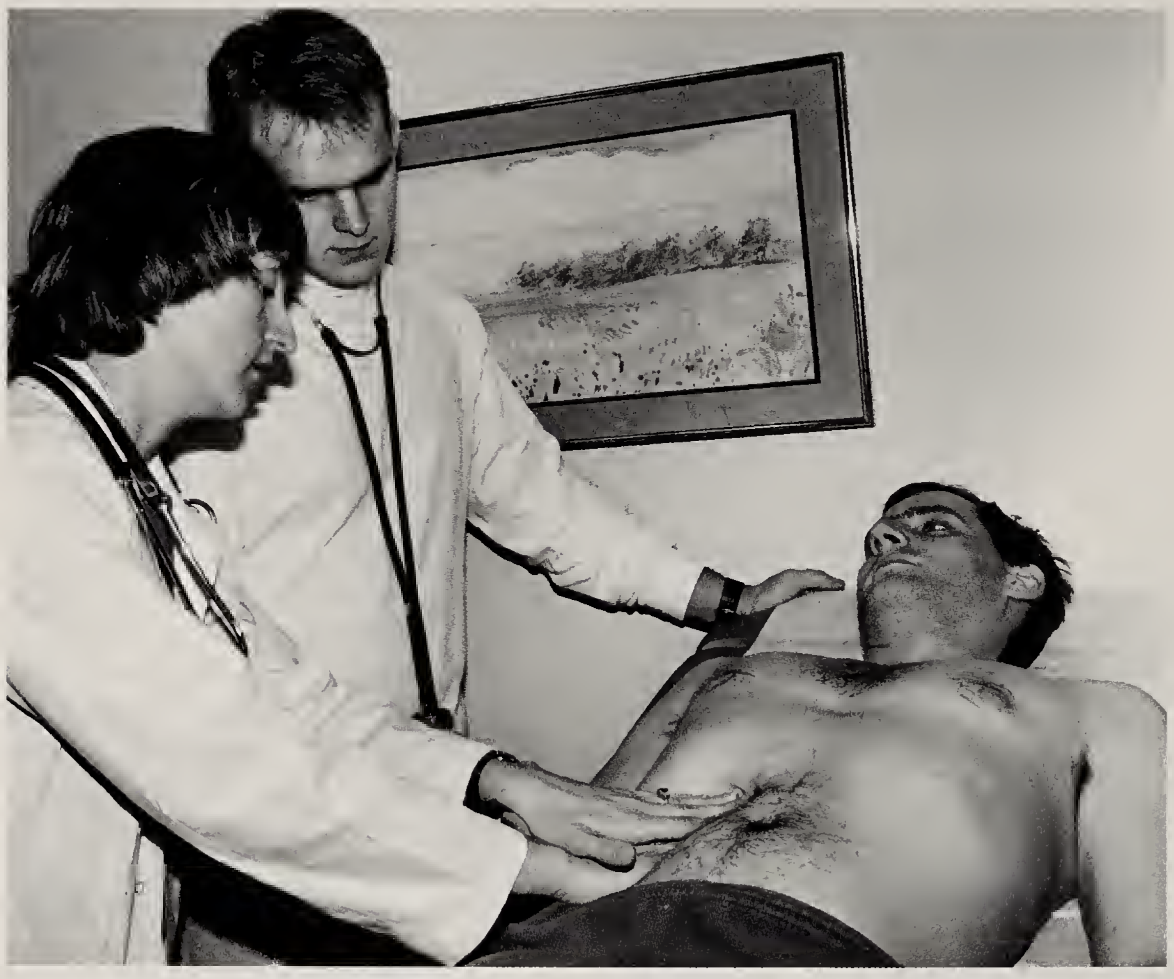
When the cause involves nutrition—a lack of the vitamin B12, for instance, or an excess of B6—damage to the nerve may, in many cases, be reversed by changes in diet.

The first sign that something has gone wrong with the sense of touch is pain or abnormal sensations, although some people notice a difficulty handling change, manipulating small objects or holding onto a can.

David Patchen, a mechanic for 14 years, first noticed numbness in his fingers. Then he felt tingling, a sensation of pins and needles that woke him even in the middle of the night. At worst, he experienced a throbbing pain that shot up his forearm.

"I had trouble using a screwdriver. Even putting a nut on a bolt gave me problems," he recalls. "I couldn't hold onto my tools, but what was worse, I couldn't hold my newborn daughter."

Patchen was diagnosed as having car-



Danuta K. Hoyer, M.D., teaches medical students the importance of the use of touch in medical diagnosis.

> ***"Caring touch connotes acceptance and reassurance... and establishes one's worth as a person."***

pal tunnel syndrome, caused when the median nerve which goes through the wrist is compressed by the swollen tissue on the surface of the tendons that surround it. This cuts down on blood circulation in the nerve, causing problems of sensation.

As a mechanic, Patchen regularly used high-powered vibrating tools. When bolts to be unscrewed were out of easy reach, he squeezed himself into spaces which forced his wrist into an unnatural position as he twisted and turned to get the job done.

When he couldn't bear the tingling and pain any longer in his right hand, he began using his left hand. Soon both sides were affected.

"At work, carpal tunnel syndrome, more often than not, is triggered by rapid, repetitive motion," says Robert Schenck, M.D., an orthopedic hand surgeon at Rush. "It's become an on-the-job hazard, not only in manufacturing and industry, but in offices as well, where computer keyboards sit atop every desk."

Dr. Schenck is quick to emphasize that surgery cannot cure everything and that "conservative" care should be tried first.

Some people get relief by wearing a splint with a metal reinforced bar that keeps the wrist from flexing and extending. Changing the way one holds a tool or altering body posture on the job may make a difference. Sometimes a change in jobs is the last resort.

For up to half the cases Dr. Schenck sees, only surgery will finally ease the pain. That was the case for Patchen.

The surgical technique Dr. Schenck used is one in a growing number of new minimal access surgeries (see "Lights...Camera...Scalpel," page 24). He is one of the first surgeons in Chicago to perform the endoscopic method of decompression for carpal tunnel syndrome. The procedure eliminates the need for a long surgical incision. Instead, only two half-inch slits are required for the specially designed instruments that allow the surgeon to divide the ligament. This allows more room in the wrist tunnel and takes the pressure off the nerve.

Because the technique is so new, Dr. Schenck has begun a nationwide survey of its effectiveness, polling the 2,000 surgeons who now use the procedure.

"It will take several years to find out if this method is as effective as the traditional procedure, but the immediate result we see is that, on the average, patients heal much faster and get back to work in about half the time," he says.

Patchen was admitted to the hospital, had surgery on his left hand and was able to go home the same day. In the late hours of that night he woke his wife, excited with the news that the pain was finally gone. Two months later he had the procedure done on his right hand.

"The best part of all of this," says Patchen, "is that now I don't have to think twice about picking up one of my kids for a quick hug."

Unlike Patchen, most of us, luckily, can take touch for granted.

Of all five senses, touch probably has the broadest scope. Not only does it give us information about the world around us, it provides vital information to others about what's going on inside us.

Danuta K. Hoyer, M.D., internal medicine, teaches Rush Medical College students about the diagnostic use of touch. In her class on physical diagnosis, students learn—by practicing on each other—the importance of the use of touch.

"Students learn the point of maximum impulse of the heart," Dr. Hoyer says. "You feel the heart up against the wall, heart size and the intensity with which it beats against the chest wall. It's like a bit of fluttering. It feels like a bird or a butterfly cupped in your hand. If you press too hard, you miss the whole sensation. It takes a very light touch—you have to concentrate, feeling with your fingertips.

"When you touch an abdomen, you can tell whether there's fluid or gas by the way it feels," she says. "You can tell whether it's an 'acute abdomen'—meaning someone who may need to go to surgery—by how rigid it is. Skin that feels cool to the touch may indicate a circulatory problem," Dr. Hoyer explains. "A hot joint may mean an arthritic process or infection."

Touch can also be therapeutic.

On a typical Tuesday afternoon, George Haloftis can be found in the Special Care Nursery at Rush, where he volunteers as a cuddler, joining nurses in providing little ones with the gentle touch considered critical to their development. Soon a tiny preemie is lulled to sleep with his comforting stroke.

"With this therapeutic touch in a soothing environment, the tiny babies have a stronger heart rate, more even respiratory rate, eat better, and may ultimately be able to go home sooner," says Judy Friedrichs, M.S., R.N., maternal-child nursing.

The benefits are not limited to children.

In her ongoing research, Linda Hollinger, Ph.D., R.N., assistant chairperson of medical nursing at Rush, has found that the elderly can also thrive on caring gestures—an arm on the shoulder, perhaps, or a soft touch of the hand.

She and her colleagues have discovered a strong relationship between caregivers' use of touch and a lower rate of depression among nursing home residents. "Caring touch connotes acceptance and reassurance. It promotes a positive self-concept and establishes one's worth as a person," says Dr. Hollinger.

Touch is considered crucial to the development of premature infants.

"We're not saying that therapeutic touch should be used for all patients because clearly not everyone is comfortable with it. But it's important to find a way to assess who would welcome such closeness, because clearly it can have a positive impact."

Perhaps Helen Keller, blind and deaf from early childhood, put it best when she said, "In touch is all loving and intelligence."—K. K.-K.

Retired Army General H. Norman Schwarzkopf (center), with Campaign Chairman Edgar D. Jannotta (left) and Board of Trustees Chairman Richard M. Morrow.

The Campaign for Rush

Medical Center announces $310 million capital campaign.

The Medical Center announced a $310 million capital campaign—$150 million of which is to come from philanthropy—at a kick-off dinner attended by more than 1,000 business, civic and community leaders at the Chicago Hilton and Towers in November. Principal speaker was Gen. H. Norman Schwarzkopf (USA, Ret.), leader of U.S. forces during the Persian Gulf War.

Edgar D. Jannotta, chairman of The Campaign for Rush, said advance gifts and pledges of $83.6 million had already surpassed the halfway mark for the Campaign as well as the total philanthropic achievement of the Medical Center's campaign a decade ago. Included in this amount were a $6 million pledge from the Medical Staff/Faculty and a $5 million pledge from the Woman's Board, to establish the Woman's Board Depression Treatment & Research Center in the Rush Institute for Mental Well-Being. (By April 1992, campaign gifts had passed the $91.4 million mark.)

Leo M. Henikoff, M.D., Rush president and CEO, paid tribute to faculty and employees whose performance had inspired the plans and served as the main stimulus for community support. "The capital campaign," he said, "will allow us to make dramatic—even revolutionary—changes in the way we deliver care."

Guests at the event viewed a 12-minute audiovisual presentation, "The Campaign for Rush: Vision and Values," narrated by television journalist Bill Kurtis. The film highlighted the primary components of the Campaign.

"I accepted this invitation because this is a great cause," Gen. Schwarzkopf told the audience.

"One of my favorite subjects happens to be the leadership crisis. Too often we focus on competence and forget that leadership is both competence and character. It seems to me that 'vision

> *"The Campaign will allow us to make dramatic—even revolutionary—changes in the way we deliver care."*

Leo M. Henikoff, M.D., Medical Center president and CEO.

and values' says the same thing. What a great theme and I'm just proud to be part of it."

Gen. Schwarzkopf also paid tribute to the Medical Center for the values it has adopted as central to its mission and operations—excellence, compassion, justice, faith and respect—saying, "You ought to be very, very proud."

The $310 million capital campaign is the most ambitious in the 154-year history of the Medical Center.

Of the total, philanthropy will provide approximately $70 million for restricted endowment, $50 million toward facilities and $30 million to support programs and acquire new equipment.

This philanthropy, together with funds generated through borrowing and operating income, will focus on support of people and programs, which includes the Rush Institutes and Rush University, and facilities.

Major components of The Campaign for Rush are:

The Rush Institutes

These are multidisciplinary centers of excellence in areas where the Medical Center already is recognized as a leader and where patient needs are great: cancer, heart disease, aging, mental illness, arthritis and orthopedics, and the neurosciences. Diagnosis and treatment will be provided in geographically unified space, for efficiency and patient convenience. Research will center on problems encountered in clinical situations.

Rush University

Devoted exclusively to the preparation of health care professionals—physicians, nurses, allied health professionals, researchers and managers—Rush University provides education and training in an environment where patient care is central. Endowment is needed to recruit and retain distinguished clinicians, scientists and scholars, to provide scholarships and financial assistance to outstanding students, and to support research.

Hospitals-Within-A-Hospital

State-of-the-art resources will be organized to care for patients with similar health problems but in comfortable, community hospital settings designed specifically for such patients. A new hospital wing joined to existing facilities will enable the Medical Center to pioneer several such mini-hospitals within the larger complex.

Research Building

Research programs of the Institutes will be housed in an 11-story facility designed also to accommodate the Medical Center's expanding research initiatives, and to promote and facilitate major collaborative research projects at Rush.

Guests included, seated (l. to r.): Mr. and Mrs. William G. Karnes, Mr. and Mrs. F Richard Meyer. Standing: Mr. and Mrs. George Cole, Dr. and Mrs. Armando Susmano. In background: Mrs. Edgar D. Jannotta, Dr. Henikoff, Gen. Schwarzkopf and Mr. Jannotta.

Surviving Domestic Violence

Anyone can be a victim, but women make up most of the casualties.

by Pamela Redd

Family violence has been around since Cain slew Abel. But only in the last 20 years or so has it been acknowledged as a serious health and social problem.

Nationwide figures are staggering—each year 10 million Americans are abused by their intimate partners or other family members.

It may be a physical injury or a verbal assault, sexual abuse or neglect. The harm may be psychological, attacks on a person's emotional well-being or sense of self.

Domestic violence crosses all socioeconomic, racial and religious boundaries. Anyone can be a victim but women make up most of these casualties, accounting for 95 percent of all reported cases, according to the Illinois Coalition Against Domestic Violence.

Former Surgeon General C. Everett Koop has called domestic violence the number-one health problem among American women. It may also be the most underreported crime against women in America.

Even so, statistics that do exist tell a grim tale. More women are injured in their homes than on the streets. Domestic violence causes more injuries than muggings, rapes and automobile accidents combined.

The violence often extends to children —half or more of the men who abuse their intimate partners also abuse their children.

In many cases, violence breeds violence. Children who are abused or grow up in violent homes may come to believe that violence can be an acceptable and efficient way to control others.

Breaking this cycle of violence is the primary goal of the Rush Family Violence Program, now in its sixth year. It is the only comprehensive hospital-based program in Illinois, and one of a handful in the country designed to assist victims of family abuse.

Intervention: The Key

The key to reducing violence is intervention and education, says Wendy Taylor, M.S., R.N., the coordinator and a counselor for the program.

"Without early intervention, domestic violence can escalate in severity and may result in death," Taylor notes. "When domestic violence results in murder, it often reflects the community's failure to recognize the life-threatening nature of the problem. Nationwide, about a third of all female homicides are a result of domestic violence, and that may be a conservative figure."

Taylor believes that nurses and physicians are in the best position to intervene in domestic violence cases because they are usually the first people outside the family to see someone who has been abused. "They are often the primary resource for victims of violence," she says.

Experts estimate that one out of five women who seek treatment in hospital emergency rooms are victims of domestic violence.

"It's important for people in health care to be aware of this," says Taylor. "If they are not properly trained, they will not be able to recognize, much less help, physically or emotionally abused patients," she says.

At Rush, the Family Violence Program works closely with emergency room physicians and nurses so that when abuse is suspected Taylor or one of the other counselors is notified.

"In the emergency room, we can intervene immediately, because patients who have just suffered an injury are more likely to accept help," says Taylor. "They are more receptive not only to counseling but also to making alternative living arrangements, joining support groups and taking legal action."

Wendy Taylor, M.S., R.N., Rush Family Violence Program.

Taylor points to a rise in the number of patients in the Rush program and growing numbers of domestic violence court cases as evidence that the problem is "at epidemic proportions."

Whether the increases are due to more violence or greater willingness to report it, she is not sure. "Domestic violence is so prevalent that assessing all women for abuse, in any clinical setting, should be an integral part of the medical history," she says.

Removing the Stigma

"Reluctance to report this crime is due in part to the stigma attached to battering as well as to the woman's shame, humiliation and fear," says Taylor. "Until recently, no one really looked at domestic violence as being a crime."

"Society has a tendency to look on spouse abuse as a private matter or as a love spat that will be over quickly," Taylor explains. "However, over time,

The emergency room is an ideal place to interview victims of domestic violence because it allows for immediate intervention.

the violence usually escalates in frequency and severity."

Taylor asks specific questions of abused patients so she can gather as much information as possible and piece together what happened. Everyone has a different definition of what constitutes abuse. Some might not view a push, a little slap, threats of physical harm or name calling as abusive behavior, but it is, Taylor says.

Some of the warning signs of potential abusers include overly controlling behavior, extreme jealousy, sudden outbursts of anger, and attempts to isolate women from family and friends.

In the beginning of an abusive relationship, a woman may find her mate's jealousy charming. No one else ever cared so much about her.

But gradually, excessive concern can turn into domination. A woman may stop going to the movies with her girlfriends to please a mate who wants her all to himself—who demands to know what she's doing, when she's doing it and with whom.

Pretty soon he's paying all the bills, driving her everywhere she needs to go, choosing her clothes and makeup. He calls several times a day to make sure she's at work. He demands "perfection"—a hot dinner on the table at 6 p.m. every evening. He feels that anything less is cause for verbal or physical abuse or both.

Blaming the Victim

"Most abusers blame their violence on their partners or something else," says Taylor. "They often deny how violent they are or have been, usually minimize what they have done and refuse to take responsibility for their actions. The majority feel a sense of entitlement and justification for their abusive behavior."

Women stay in abusive relationships for many reasons. "They may leave periodically, but they return because of religious beliefs, fear, intimidation, and a lack of money and support from friends and family to allow them to make it on their own," says Abigail Sivan, Ph.D., a clinical psychologist in the Department of Psychiatry at Rush.

"They usually believe there's no one to turn to because their abusers often keep them isolated. They lose the ability to take action on their own behalf."

According to Dr. Sivan, many battered women minimize their abusers' violent behavior and somehow feel they are responsible for their abusers' actions. They try to make excuses.

Maybe the dress she wore for that romantic dinner on the town wasn't pretty enough. Maybe her shoes made her taller than him. Maybe she wore too much makeup, talked too loud, talked about the wrong things.

"In general, society holds the woman responsible for the success or failure of a relationship. And abusers often blame their victims for provoking the violence."

One in six cases handled by Tamara Goldman Sher, Ph.D., a marital counselor in the Department of Psychology and Social Sciences at Rush, involves abuse.

"A key element that hinders these women from leaving their abusive partner is low self-esteem. Having little or no self-esteem is very paralyzing for people," she says. Other factors include worry about the children and the good-wife syndrome, when a woman believes, "I can't leave him. He needs me."

Abusers often try to blame the effects of alcohol for their behavior. Studies have shown that about half of the men who beat their mates also abuse alcohol. "Alcohol can play a part, but it is not the cause," says Taylor.

Breaking the cycle of violence is the primary goal of the Rush Family Violence Program.

"Many abusers are very apologetic after a battering incident," she says. "They may try to make up for their actions with expensive gifts, and even promise never to hit their mates again. And at that particular moment they may be very sincere."

But something eventually triggers another violent episode and the cycle of violence repeats itself.

Keeping accurate and detailed medical records, including photographs of the injuries, in domestic violence cases is vital, says Taylor. Medical records are legal documents admissible in court. Survivors of domestic violence have a better chance of making their case stick in court when they have documented evidence that they were injured and required medical treatment.

Taking Control

A victim of abuse can obtain an order of protection, which is issued by a judge and has more clout than a restraining order or peace bond. Its purpose is to protect the victim by prohibiting the abuser from further harming and harassing the person or destroying property. If the abuser violates the order, he can be held in contempt of court, arrested and jailed.

Women who attempt to leave their abusive partners take the risk of suffering worse violence.

This was the case in two recently publicized incidents with tragic outcomes—the Milwaukee woman stabbed to death by her former live-in companion and the northwest suburban woman whose estranged husband shot her down in her Mt. Prospect office.

Critics of the legal system argue that the law too often fails to protect battered women.

Last year 20,000 cases involving domestic violence were prosecuted in Chicago. Only 1,300 convictions were handed down, according to the Domestic Violence Court Advocacy Program. Instead of being jailed for violent acts, abusive men are frequently released by disbelieving judges.

Society's indifferent attitude toward abuse may be slowly changing, however. Within the last year the number of orders of protection handed down by judges in Illinois increased 62 percent, according to Anson Emmerling of the Illinois Coalition Against Domestic Violence. "This may be attributed to an increase in awareness and a growing sense of empathy," he says.

At Rush, counselors provide abused women with up-to-date information about shelters, support groups and the legal resources available to them.

Says Taylor, "Our clients usually begin the process of getting out of abusive situations when the time is right for them, when they have gathered their courage and strength, and when they gain true confidence within themselves."

Education is often the key to breaking the cycle of violence.

According to Taylor, "Through education, we can empower women who have been abused and help them take control of their lives. We make them aware of their options and reassure them that they do not deserve to be verbally, physically or emotionally abused by anyone. We inform them that physical violence is a crime and should be treated as such. We let them know they are not alone and that they don't have to face this situation by themselves. We are here to help them."

> ***"Through education, we can empower women who have been abused and help them take control of their lives."***

Lights...Cam

A mini video camera she

Although a gallbladder removal won't make the Nielsen ratings, video technology is revolutionizing surgery.

Until recently, surgery to remove the gallbladder—called cholecystectomy—always meant a six-inch abdominal incision and four or five days in the hospital, followed by up to six weeks to recuperate. But last August, Marilyn Dort, 57, had her gallbladder taken out on a Thursday and was discharged from the hospital the next day. By Sunday, she was driving and taking long walks. A week later, she was back at work.

"My family was astounded that I was up and about so quickly," says Dort, a Chicago nurse.

Dort had a laparoscopic cholecystectomy, one of a series of new minimal access techniques that are transforming the way surgeons operate. "Minimal access" refers to the fact that the surgery is performed through tiny holes instead of a large incision. This means less skin, muscle and nerve damage, so patients are out of the hospital and back on their feet in days instead of weeks.

In these new operations, a mini

era...Scalpel

s new light on surgery.

by Cheryl Janusz

video camera attached to a telescopic tube allows a surgeon to see inside a patient's abdomen or chest through a puncture. The camera transmits a vivid, magnified picture of what's going on inside the body cavity to a nearby video monitor. Guided by this video image, the surgeon uses miniature, specially adapted surgical instruments to extract diseased organs, remove benign tumors, or perform intricate procedures such as hernia repairs—all through four or five incisions, each smaller than the tip of a finger.

"Minimal access techniques aren't a gimmick. Of course, there are risks, just as there are with any type of surgery. But these new techniques are fundamentally changing our approach in the operating room," says Steven G. Economou, M.D., the Helen Shedd Keith Professor and chairman of the Department of General Surgery.

"With everything on the screen magnified more than 10 times, one can even see small blood vessels that might otherwise escape the surgeon's view," he explains.

The idea of operating through tiny incisions isn't new. As early as 1910, European doctors were

Marilyn Dort was up and about within days of minimal access gallbladder surgery.

performing abdominal exploratory procedures through small viewing tubes. But the addition of video technology in recent years has broadened the appeal of this technique for surgery.

The simple viewing tube has been replaced by a scope—a telescope-like device with a miniature camera and fiberoptic light bundle fastened to its end.

Nearly every field of medicine uses a scope for some procedure. With a colonoscope, gastroenterologists inspect the colon. With an arthroscope, orthopedic surgeons examine and repair damaged knee joints. With a laryngostroboscope, voice pathologists explore vocal-cord problems. And the list goes on.

In general surgery, many common operations are performed with a laparoscope, designed to inspect the inside of the abdomen. Introduced just a few years ago, laparoscopic cholecystectomy now accounts for about 80 percent of gallbladder surgeries. More recently, laparoscopy was also adopted for appendectomies.

Like most minimal access surgeries, laparoscopic cholecystectomy and appendectomy are performed under general anesthesia. Once the patient is asleep, the laparoscope is slipped into the abdomen through a quarter-inch incision, typically at the navel. Small tubes called trocars are placed to let the surgeon insert miniature forceps, scissors and other surgical tools.

> ***"Minimal access techniques... are fundamentally changing our approach in the operating room."***

Through one trocar, carbon dioxide is pumped into the abdomen, lifting the skin and muscles above and away from the internal organs. "This gives us a larger field to work in and improves the view we get through the camera. It lets us see everything in the abdomen, including the surgical instruments, with absolute clarity," explains Daniel J. Deziel, M.D., associate professor of general surgery at Rush.

Vanguard Techniques

Surgeons say that laparoscopy lets them achieve the same goals as traditional, open-abdomen surgery—but with several significant advantages to patients. "In addition to less pain and a quicker recovery, laparoscopy offers the cosmetic advantage of a much smaller scar," says Jose Velasco, M.D., associate professor of general surgery and chairman of the Department of Surgery at Rush North Shore Medical Center in Skokie, Illinois.

"The appendix, for example, is only the size of an index finger. As long as it hasn't ruptured, it's fairly easy to remove through a small incision," he explains.

A few years ago, the only way to be sure someone even had appendicitis was to cut open the abdomen. "With laparoscopy, we can confirm diagnoses through a tiny hole," says Dr. Velasco. "If it's appendicitis, we remove the appendix laparoscopically. If it's not appendicitis, we've avoided the muscle and tissue damage of a traditional operation."

Eileen Hurt, 31, had a laparoscopic appendectomy last June. With two preschool-age children and a full-time job as a bookkeeper, she was panicked by the prospect of weeks of disability. "My sister and brother each had an appendectomy years ago and they were both off work for well over a month," recalls Hurt.

But after a laparoscopic appendectomy, she was home the next day and back at work a week later. "Two days after the operation, I no longer needed pain medication," she says.

As new miniature instruments are developed, other laparoscopic operations are becoming possible.

One of the most recent is laparoscopic nephrectomy, or kidney removal. In this surgery, the diseased kidney is dissected into small pieces, which are then vacuumed out of the body with a small suction device, operated through a tube in the abdomen.

Other vanguard techniques include laparoscopic hernia repair, in which special instruments are used to stitch a piece of synthetic mesh to repair ruptured tissue. Using laparoscopic guidance, surgeons can also patch ulcers that have perforated the stomach wall.

Patients with recurrent ulcers may benefit from still another laparoscopic surgery to decrease the amount of corrosive acid produced by the stomach. Using a tiny blade, a surgeon can cut the vagus nerve, which stimulates acid-secreting cells.

Laparoscopic techniques are changing some conventional gynecological surgeries, too. Laparoscopes are now commonly used to remove ovarian cysts and small fibroid tumors, and to treat endometriosis.

When endometriosis strikes, the tissue that normally lines the uterus grows outside of the uterus, sometimes causing severe menstrual cramps, gastrointestinal symptoms and even infertility. Using a laparoscope tipped with a laser, gynecologists can vaporize this troublesome endometrial tissue with a focused zap of laser energy.

In certain cases, laparoscopy is used to extract larger fibroid tumors or to terminate dangerous ectopic pregnancies, which occur when fertilized eggs attach and grow outside the uterus. Over the next few years, experts predict that laparoscopy will become a more common technique for performing hysterectomies.

Now, about one-third of conventional hysterectomies are performed vaginally, with the rest done through a six-inch abdominal incision. Women who've had previous abdominal surgeries generally cannot have vaginal hysterectomies. The same holds true for women with endometriosis, large fibroids or extensive scar tissue.

But with help from a laparoscope, many of these women can avoid long abdominal incisions.

New techniques require the development of special surgical instruments.

Quicker Recovery

"With laparoscopy, we can detach the ovaries and uterus, and seal off the blood vessels through a tiny hole in the abdomen. Then these organs are removed through the natural opening of the vagina," says Julian T. Archie, M.D., associate professor of obstetrics and gynecology at Rush. The average hospital stay after this surgery is a day and a half, as compared to four to six days after an abdominal hysterectomy.

Minimal access techniques are also transforming colon surgery.

When a cancerous growth called a polyp was found on the lower portion of her colon, 77-year-old Gladyce Doering of Green Bay, Wisconsin, was advised by medical experts to have most of her colon removed. She was warned that her recovery would be slow and that bowel function would never be normal. With much of the colon gone, a hole in the abdominal wall—a colostomy—would provide for the elimination of waste.

But thanks to a new surgical technique, transanal endoscopic microsurgery, Doering now has an intact colon and near-normal bowel function. Her recovery from the surgery was quick and virtually painless. Best of all, one year later she's cancer-free.

In this microsurgery, an instrument called a rectoscope is used to remove rectal polyps and certain superficial cancers of the rectum and sigmoid—the part of the colon immediately above the rectum. The procedure is performed through the anus, so no abdominal incision is required.

The technique was developed and perfected by Professor Gerhard Buess of the Eberhard-Karls Universitaet, Tubingen, Germany. Theodore J. Saclarides, M.D., assistant professor of general surgery at Rush, is one of a handful of U.S. surgeons trained to perform this microsurgery.

"Removing polyps through the anus isn't new. But conventional surgical tools confine surgeons to the lowermost five to eight centimeters of the bowel," says Dr. Saclarides. "The rectoscope gives us access to polyps as high as 20 centimeters up in the bowel—an area previously accessible only through a large abdominal incision."

Because it allows the surgeon greater precision, transanal endoscopic microsurgery is also used in cases like Doering's, to remove larger cancers that might otherwise warrant removal of the colon.

For noncancerous polyps too big or otherwise inaccessible to a rectoscope, Dr. Saclarides performs laparoscopic colectomies. Guided by a laparoscope, he can dissect a section of the colon and then remove it through a small hole in the abdomen, sparing the patient the trauma of standard abdominal surgery.

Unlike laparoscopic gallbladder removal, these techniques probably won't be common at small hospitals, says Dr. Saclarides.

"Operations like transanal endoscopic microsurgery are more difficult to perform than the average laparoscopic surgery and the equipment is expensive. As a result, this type of surgery will likely be done more frequently at a university center," he says.

Remapping the Chest

While colorectal surgeons pave less invasive paths to the colon, thoracic surgeons are remapping the chest. Using a technique called thoracoscopy, surgeons can explore the lungs and surrounding space through small holes in the chest, avoiding the muscle cutting required by many standard open-chest operations.

"We've been diagnosing thoracic problems with a scope for more than 50 years. But with video technology, we can now correct certain problems as well as diagnose them," says William H. Warren, M.D., associate professor of cardiovascular-thoracic surgery and pathology at Rush.

Thoracoscopy spared Sharon Taylor, 31, of Gary, Indiana, the five-inch incision she would have needed for a standard lung biopsy.

Taylor, who had a long history of breathing difficulties, was sent for a biopsy after a lung x-ray revealed the presence of abnormal tissue. Through thoracoscopy, a sample of lung tissue was removed, tested, and found to be free of cancer. Also, much of the abnormal tissue—scarring from previous lung infections—was taken out.

With most of the scar tissue gone, Taylor's breathing problems are easing. Antibiotics are clearing up her remaining symptoms. "I'm grateful that I don't have cancer," she says. "But I'm also grateful I didn't have to get a large scar to find that out."

During thoracoscopy, the patient is put on a ventilator and air to the lung undergoing surgery is blocked. The thoracoscope is then inserted through a half-inch incision in the middle of the chest, while surgical instruments are maneuvered through two other half-inch incisions, strategically placed elsewhere on the chest wall.

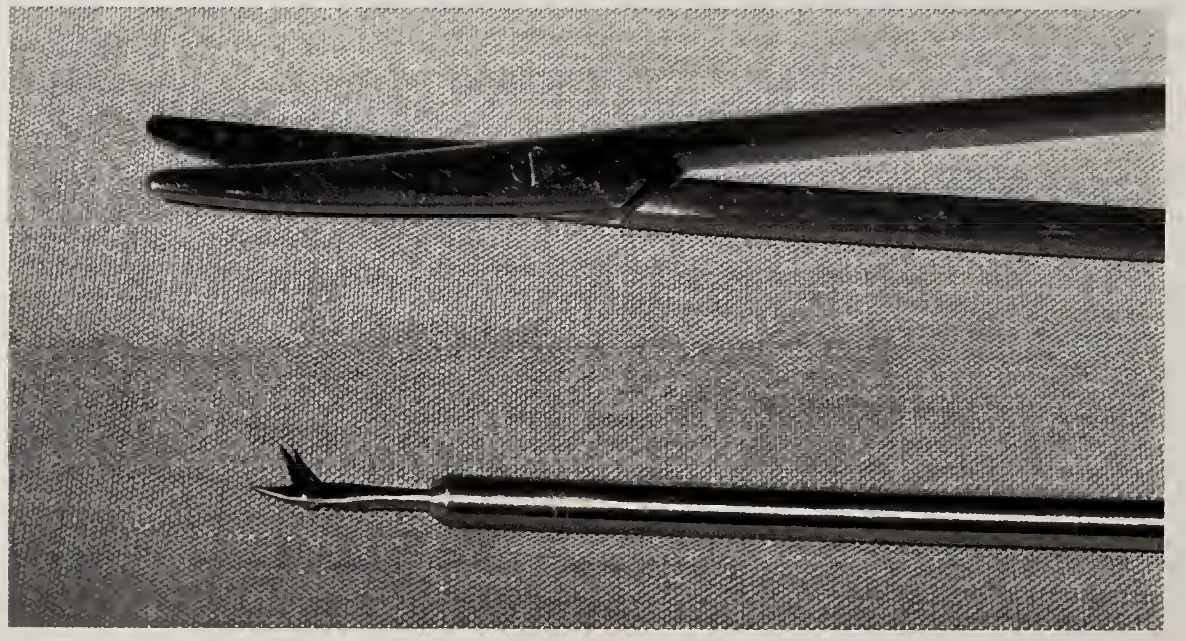
Thoracoscopy is being used successfully for other common chest procedures, such as removing cysts and benign tumors, draining abcesses and fluid collections, and resecting blister-like areas on lungs that rupture and cause lungs to collapse.

"If a cyst or benign tumor is found, small staplers and blades are used to remove the wedge of lung tissue. Other lesions can be dissected away and removed, or removed with a laser," says Douglas R. Norman, M.D., a thoracic surgeon at Rush North Shore.

As new miniature surgical tools are developed, thoracoscopy will be used for more procedures. But experts caution that the technique shouldn't be seen as a panacea for every chest ailment.

"We can only remove so much tissue through a tiny hole," explains Dr. Warren. "To remove a large piece of the lung, we'd have to widen the incision to the point where we might as well do traditional surgery."

The mini camera, attached to the end of a telescopic tube, fits in the palm of a hand.



Surgical tools used in the new minimal access techniques are a fraction of the size of standard instruments.

The camera transmits a magnified picture of what's going on inside the body to a nearby video monitor which guides surgeons during minimal access procedures.

Not A Cure-All

Thoracoscopy isn't an option for patients with extensive lung problems like end-stage emphysema. Traditional surgery is also favored for patients with lung tumors proven to be cancerous. With thoracoscopy, explains Dr. Warren, only a small piece of the lung, not the entire lobe, is removed. Many experts question the long-term benefits of this more limited type of surgery for curing early lung cancer, even when performed through a large incision.

"It's possible that taking out the whole lobe is the best way to prevent cancer from recurring," says Dr. Warren. "Right now, there's no clear answer. But the debate should be settled by scientific data rather than a patient's desire for a small incision."

For other cancers, techniques like laparoscopy aren't generally used to extract tumors—at least for now, says Thomas R. Witt, M.D., associate professor of general surgery at Rush.

"Using current minimal access technologies, it's unlikely that the entire cancer could be removed. Also, there's concern about spilling tumor cells," says Dr. Witt.

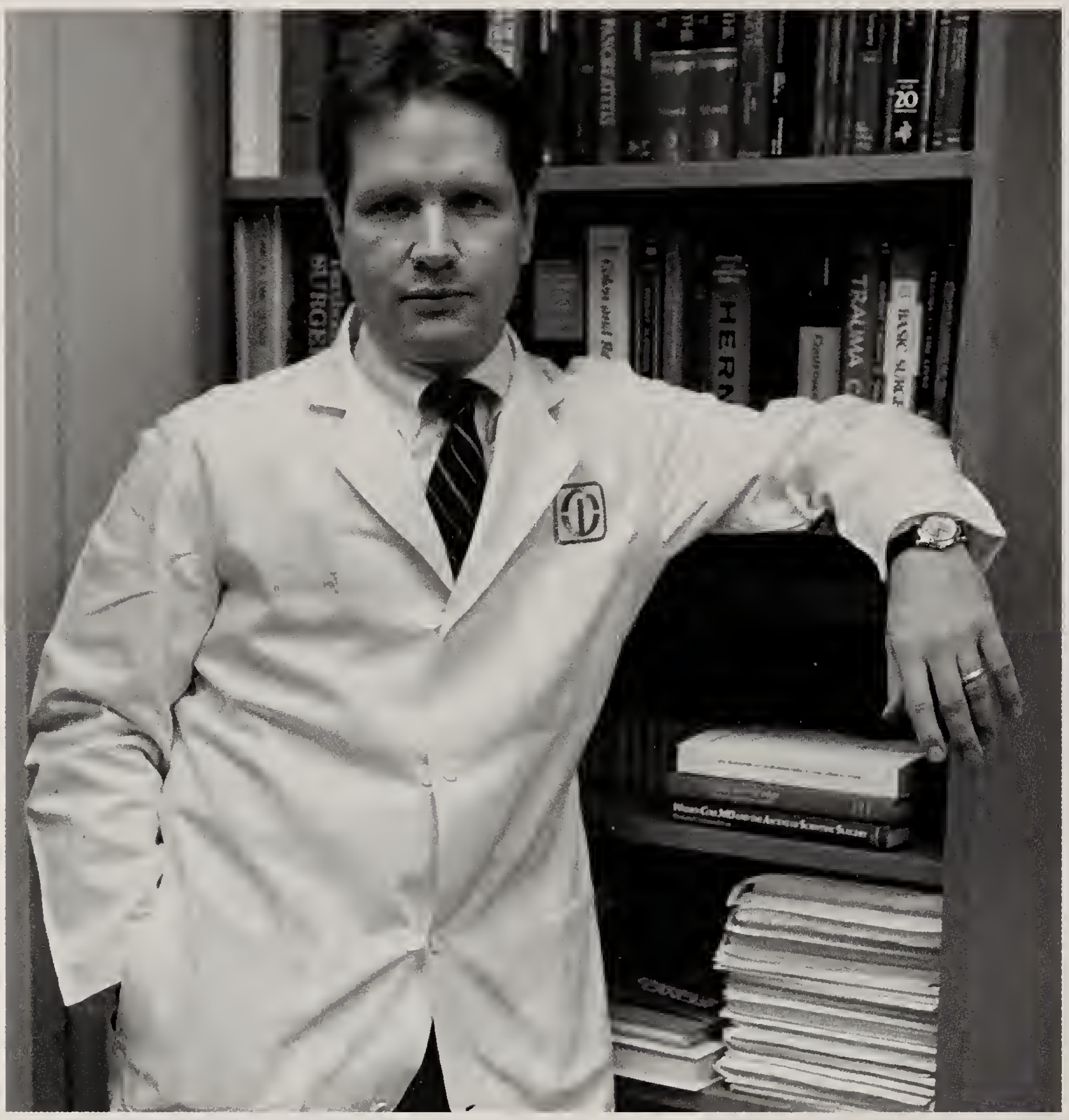
One exception is the use of transanal endoscopic microsurgery to extract malignant colon and rectal polyps. Caught early enough, these cancers tend to be superficial and self-contained. "So an endoscope can usually remove the entire cancer quite effectively," says Dr. Witt.

Still, this microsurgery is used selectively. Bulky, invasive colon and rectal tumors are always removed through abdominal surgery, says Dr. Saclarides. Even for small malignancies, he's hesitant to pronounce the surgery a cure-all.

"Is transanal endoscopic microsurgery as effective for cancer as traditional abdominal surgery? We still don't know for sure," says Dr. Saclarides. "Minimal access bowel surgeries haven't been around long enough for us to establish good, scientific success rates. Even today, not many are performed outside Europe."

While they have limited use in cancer surgery, minimal access techniques have transformed cancer diagnosis. In the past, surgeons had to cut a patient open to see if cancer had spread throughout the abdomen. Now, this can be done laparoscopically. Through a little hole, surgeons remove a tissue sample and look for evidence of liver involvement and "peritoneal seeding" —implants of tumor on organ and tissue surfaces.

"These are signs that the cancer has spread beyond the primary tumor site,"



Daniel J. Deziel, M.D., general surgery.

says Dr. Witt. "Knowing this helps us determine if the best treatment to remove the tumor is surgery, radiation therapy, or chemotherapy."

For cancers of the urinary tract, laparoscopic biopsies are sometimes performed to determine whether cancer has spread to the lymph nodes. "If we find that cancer has not spread to the lymph nodes, we know that the patient is a candidate for radiation therapy or surgery. Before laparoscopy, this treatment decision could only be confirmed through extensive abdominal surgery," says Bruce Berkson, M.D., a urologist who performs laparoscopic biopsies at Rush North Shore.

Across the country, these minimal access surgeries are being performed with stunning technical success. But most surgeons temper enthusiasm with caution.

Today, laparoscopic gallbladder and appendix removals are standard. "We've had enough experience to know they're as successful as traditional surgeries," says Dr. Deziel. "But the long-term benefits of some of the newest techniques remain to be scientifically evaluated."

Complications unique to minimal access surgeries are also under study. Surveying hospitals nationwide, Dr. Deziel has collected data on more than 75,000 patients who had laparoscopic cholecystectomies. Comparing complication rates with those of traditional surgery, he found that laparoscopy involves a higher risk for blood vessel damage and injury to other structures such as the intestines and bile duct. "These complications, while very rare, can be fatal," says Dr. Deziel.

His findings also suggest that a surgeon's breadth of experience with laparoscopy can influence a patient's risk for injury. In the operating room, if it appears that a case is more complex than previously suspected, surgeons are required to abandon laparoscopy and revert to traditional surgery. "More experienced surgeons seem better able to judge when laparoscopy poses a serious risk," says Dr. Deziel.

Minimal access operations aren't regulated by the Food and Drug Administration. But professional organizations like the Society of American Gastroenterologic Surgeons and the American College of Surgeons have issued guidelines stating, among other things, the qualifications a surgeon needs to have to perform minimal access operations. Laparoscopic cholecystectomy, for example, should only be done by qualified biliary surgeons who have demonstrated proficiency in laparoscopic techniques.

Dr. Archie, who has performed minimal access gynecological surgeries for more than 20 years, says "patients should be smart consumers.

"Any new technique, minimal access or otherwise, involves a learning curve," he says. "If you're having surgery, make sure your surgeon is familiar with the procedure and knowledgeable about potential complications. There's nothing wrong with making sure that your surgeon is operating within the realm of his or her experience."

> ***"Patients should be smart consumers... Make sure your surgeon is familiar with the procedure."***

Bringing More Minority Students Into Medicine

by Beverly B. Huckman and Bruce Rattenbury

Beverly Huckman, equal opportunity coordinator for academic affairs at Rush University, chaired the Rush Task Force on the Recruitment of Minority Medical Students. Bruce Rattenbury, associate vice president for philanthropy and communication, was a member of the task force. This summary of the group's findings outlines the dimensions of a national problem and offers guidance on how it may be addressed.

Greatly increased enrollment of minority students in medical school in America today has become a moral, social and corporate imperative. It calls for bold and demanding measures which, to borrow an analog from the practice of medicine itself, could justly be described as "heroic."

The problem is simply stated: The accelerating growth of a major segment of our society has steadily outpaced the development of resources to meet even its most basic health needs.

This issue is not a new one. A generation ago the Association of American Medical Colleges (AAMC) assigned high priority to bringing minority physicians and populations into better balance.

The problem, at first, appeared to be responding to these early energetic efforts. In the mid-1960s, approximately 12 percent of the total U.S. population, but still fewer than three percent of physicians, were from minority groups underrepresented in medicine—blacks, Mexican-Americans, mainland Puerto Ricans, and American Indians. By 1975, first-year enrollment of underrepresented minority students in U.S. medical colleges had risen to 10 percent. That was, relatively speaking, a high-water mark.

In 1990, the same minority groups had grown to over 19 percent of the total U.S. population. Their representation in medical college entering

ISSUES IN HEALTH CARE

Under the guidance of Wayne C. Williamson, M.D. (center), internal medicine, a Rush medical student examines a patient.

classes, however, was still only 10 percent. This worsening condition of an expanding low-income population, together with a loss of momentum in medical school recruitment efforts, lends added urgency to measures to reverse the impact of these trends.

The AAMC has recently established "Project 3000 by 2000," whose primary goal is to increase first-year medical school enrollment of underrepresented minority students to 3000 by the year 2000. This will mean nearly doubling the 1,584 students who entered medical school in 1991.

Robert G. Petersdorf, M.D., president of the AAMC, has said the project "is based on the premise that academic medical centers are an integral part of the communities they serve." The new national program will employ multiple strategies, including:

- Intensified efforts to recruit undergraduate minority students through innovative admissions agreements and identification of those "lost in the pipeline."
- Linkages of academic health centers with undergraduate colleges and local school systems. This calls for the creation of magnet health sciences high schools with substantial minority enrollments, better tracking of students who demonstrate an interest in science and a program of student summer and after-school jobs that nurture their interests.
- Curricular enrichment and teacher training programs.

Why is it so important to increase the supply of minority health professionals?

For starters, consider the dimensions of the health problems represented by this group. Every index and census tells us that the nation's populations of blacks, Mexican-Americans, American Indians, and mainland Puerto Ricans will continue to grow. Within these populations are found a disproportionate number of the poor, the disenfranchised, the uninsured, and the working poor. Life expectancy is lower, infant mortality is higher and they are more at risk of death from disease.

Who serves the health needs of underrepresented minorities? In a broad sense, the entire health provider community does. A closer look, however, shows a strong correlation between a physician's ethnic background and that of the population he or she will serve.

> ***"Increased enrollment of minority students will call for bold and demanding measures."***

One study of minority medical school graduates found that "black patients comprised 56 percent of the total patient population of the black graduates." The same study showed that Hispanic patients (Mexican-American and Puerto Rican) represented 30 percent of patients seen by Hispanic physicians. As a group, however, minority patients represented only 21 percent of the patients seen by white physicians.

It is also significant that minority medical graduates go into primary care disciplines, where there is greatest need, in higher percentages than do white physicians who opt more often for subspecialties.

In keeping with its own history, tradition, and mission, Rush Medical College will be a strong contributing partner to the national recruitment effort. Rush has had a distinguished reputation in the preparation of black and other minority medical professionals to serve the community. In 1847, it was the first medical school in this country to award a degree to an American-born black, Dr. David Jones Peck. The first black dean of an American medical school was a Rush alumnus, Dr. Numa P.G. Adams, who was named dean of Howard University School of Medicine in 1929.

The reopening of Rush Medical Col-

The prospect of a career in the health professions should be presented as a realistic option to minority students.

lege in 1971 was done in conjunction with a Medical Center plan for a system that would not only assume responsibility for a "fair share" of the medically underserved, it would aggressively play a part in alleviating the minority physician shortage detailed by the AAMC. The effort was so successful that in 1977 Rush had the highest percentage of black first-year students of any medical school in Illinois—over nine percent.

As the 1990s opened, the situation was considerably changed, both nationally and institutionally. While the number and percentage of total applicants to U.S. medical colleges had fallen substantially between 1975 and 1990, the number of minority applicants was fairly stable, and their percentage had risen slightly. A critical difference in 1975 was that 39 percent of all applicants and 41 percent of minority applicants were accepted to medical school. In 1990, the acceptance figures were 59 percent of all applicants and only 51 percent of minority applicants. In other words, national recruitment efforts notwithstanding, the minority student acceptance rate had declined relative to that of the total pool. The situation at Rush generally paralleled the national trend, further aggravated by the fact that Rush is a younger private institution with a somewhat higher tuition and fewer scholarship dollars than many other medical schools.

The reasons for these disappointing application and acceptance data are difficult to isolate, but clearly a factor is the limited size of the recruitment pool. Competition from other disciplines and inadequate financial aid mechanisms also play a part. Possibly the most overlooked factor is that the prospect of careers in the health professions is not held out to minorities as a realistic option at a time when they could be preparing to meet the requirements of such careers. Nor has the necessary educational support always been available once they have decided on a career in medicine.

Increasing the supply of underrepresented minorities in medicine is complex and will be costly. It will demand persistence, patience, flexibility, imagination and dedication.

In January 1990, the Rush Task Force on the Recruitment of Minority Medical Students was formed. It included administrators, faculty, residents and students. For 17 months it examined this issue from every aspect. In its report submitted to Dean Roger C. Bone, M.D., the task force advocated a comprehensive concept—Rush Equal Access to Careers in Health (REACH)—for increasing minority medical student enrollment.

The report includes a number of major recommendations as well as new program designs, and proposes a solid institutional foundation for Rush University financial aid programs to serve all students of need. It develops a continuum of Rush identification and academic support programs from high school through medical school, with an affiliation that reaches into the elementary schools. It also outlines the necessary funding to accomplish these objectives. Each of these initiatives has a dual focus—a short-term purpose of recruiting more minority medical students and a long-term purpose of making Rush an even stronger institution for the education of professionals in the health sciences.

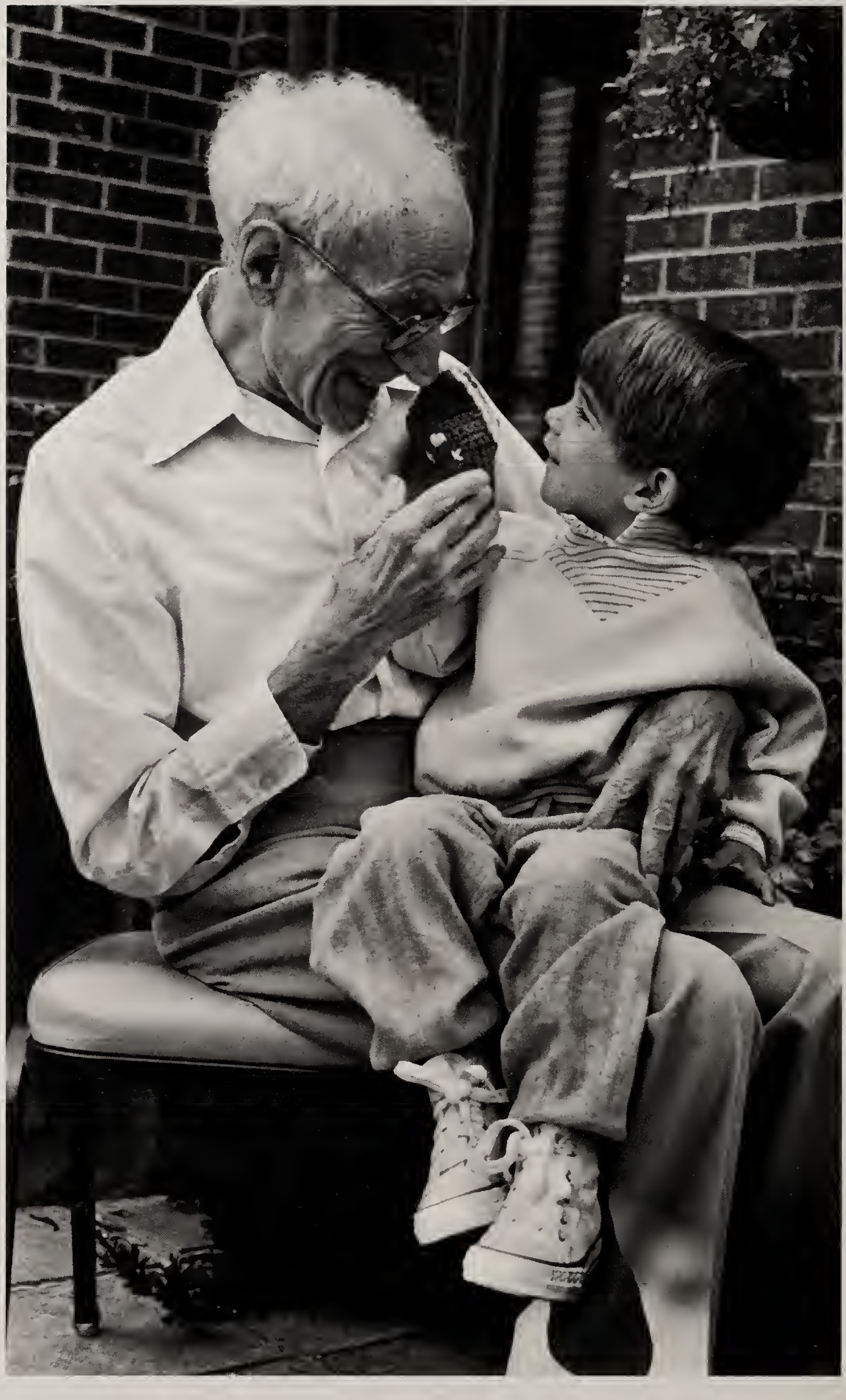
What the future will hold will depend on several factors. Internally, a high level of commitment must be sustained throughout the entire recruitment and educational process, not only by the leadership of Rush, but also by staff, faculty, students and alumni. Externally, philanthropic support of financial aid programs will make Rush more competitive in attracting qualified minority students.

Without these, REACH will be little more than a high-minded blueprint for dealing with a national problem whose devastating impact is felt daily by a growing population of fellow Americans. With them, Rush will again, as in the past, offer a regional example in addressing a national imperative.

When a Cure Is Not Possible

Medical research tackles quality of life.

by Marie Mahoney



Morbidity and mortality—sickness and death. For many years, these were the watchwords of medical research.

When evaluating new treatments for cancer and chronic diseases, researchers traditionally addressed straightforward concerns: Does the new therapy slow down or reverse the progress of the disease? Does it keep people alive longer?

Within the last two decades, however, they have begun to ask another question as well: How does a given treatment affect quality of life—the intricate relationship between physical health, emotional well-being, job satisfaction, and social and family life?

Medicine can extend life, but is there a commensurate improvement in the day-to-day life of senior citizens? New therapies have been developed for cancer, but do the side effects cancel out their benefits? For people with AIDS, medical science can really do little more than ease symptoms.

More and more, medicine is confronted by cases like these, where a cure is not yet possible—and surviving is not always a victory.

What Is Quality of Life?

Close relationships with family and friends, physical health, emotional well-being, job satisfaction: If you can count on these, chances are you judge the quality of your life to be good.

What happens, though, when illness intrudes and upsets the equation? People often find that the destructive power of disease is felt more in its impact on daily living than in its physical effects.

"Illness is disruption," says David Cella, Ph.D., associate professor of psychology and social sciences, and director of psychosocial oncology at the Rush Cancer Center. "It makes your life a mess. It makes you afraid, it makes you angry, it interferes with your ability to do the things you like to do.

"Physicians sometimes think about illness in those terms," says Dr. Cella. "But generally they're taught to think first about the patient's disease. They will ask, 'What treatments are available? How can we measure responses to treatment? What are the signs of disease progression?'

David Cella, Ph.D., psychology and social sciences.

"People's lives are not just physical," he says. "Some people fall apart when they can't function physically. Others are quite peaceful about it. Those are very different kinds of people. We don't do a very good job of training health professionals to deal with those differences.

"Even some patients whose personal lives have deteriorated as a result of illness don't think it's something they can bring up with their doctors because it's not 'medical.'"

Quality of life research provides some useful tools to educate health professionals about the myriad effects of illness on people's lives.

Researchers look at universal components of life satisfaction along with special concerns identified by people with various diseases. With this information, they create questionnaires to assess the impact of an illness on all aspects of a person's life.

Standard questionnaires have been designed for several types of cancer, for elderly patients, and for chronic diseases like AIDS, hypertension, kidney disease, heart disease and arthritis.

Dr. Cella is using some of his own questionnaires in a project aimed at improving quality of life for patients with breast, lung and colon cancer who are undergoing chemotherapy.

His approach is quite simple. Researchers conduct in-depth interviews with study participants once a month, asking them about such things as fears and anxieties, physical complaints, spiritual concerns, and their relationships with family, friends, employers and health care providers.

Dr. Cella and his staff let oncologists and nurses know if one of their patients reports a high degree of difficulty in any area or if a problem is worse than expected. They also encourage patients to think about ways they can improve their own situations by becoming more active.

"Most of the physical and psychological repercussions of cancer *can* be treated," says Dr. Cella. "But there have to be channels for communication between patients and health care professionals."

The interviews open those channels. "If a cancer patient is asked a general question like, 'How have you been feeling?' that person might not volunteer information about a problem he or she thinks is either embarrassing or unrelated to the disease," he says. "Patients may also be reluctant to 'bother' health care professionals. Some may be afraid that a treatment will be taken away if they complain.

"On the other hand, if patients are asked specific questions, they're effectively being given 'permission' to bring up their concerns."

For example, a breast cancer patient who has undergone a mastectomy would be asked whether she feels sexually attractive. If she's concerned about this area of her life, her doctor may recommend that she join a support group.

Dr. Cella thinks most people appreciate a sympathetic ear.

"When you sit down with someone and ask about any problems he or she may be having, it's often perceived as supportive," he says.

Such "indirect counseling," which does not require special training in

Close relationships with family and friends, physical health, emotional well-being and job satisfaction are all important to quality of life.

psychology, could be incorporated into routine patient visits.

"Long-term psychological support is definitely helpful, but it's also time consuming and expensive. Not all patients are willing or able to make the necessary commitment," he says. "Our hypothesis is that we can make great gains in quality of life with a minimal investment of time on the part of a nurse—no more than 20 to 30 minutes per patient, per month."

Evaluating Treatments

Quality of life studies also provide a way to evaluate the outcome of treatments more broadly.

This has been officially acknowledged by the Food and Drug Administration. When approving new cancer treatments, the FDA does not just consider a drug's power to extend patients' lives. It also looks at how the drug can improve the quality of those lives. Traditional methods of evaluating treatments haven't taken that into account.

"So-called objective signs that a disease is responding to treatment do not always translate into a benefit for the patient," says Dr. Cella.

"Let's say a drug shrinks certain cancerous tumors, but has no demonstrated effect on survival.

"In this case, there *is* a measurable physical response. But look at the bigger picture. Patients aren't living any longer, and the drug causes chills, flu-like symptoms, depression, irritability. The benefit of tumor shrinkage can't be measured in any way.

"Should the drug be used?" asks Dr. Cella. "The logical response would seem to be, 'Of course not.' But if all you consider is tumor response and survival—the traditional way to evaluate treatment—you might say, 'Well, we see this tumor response. Maybe if we try something along with it we'll extend survival as well.' This ignores the side effects that can significantly diminish someone's quality of life."

Nurse researcher Joyce Keithley, D.N.Sc., R.N., agrees.

"Quality of life is one of the best benchmarks of whether treatments actually work," she says.

Dr. Keithley, chairperson of surgical nursing at Rush, recently completed a study of changes in nutrition and immune status in the various stages of AIDS infection. Her study included a measure of patients' quality of life.

"With nutritional support regimens, it's possible to improve nutrition and, potentially, survival in AIDS patients," she says. "But if the patient is dissatisfied with the quality of that survival, then we haven't accomplished what we set out to do."

"In the care of AIDS patients, we know that what we can now do is not going to provide a cure. Our goal is to enhance quantity *and* quality of life."

Widening the scope of medical research will make it easier for physicians to help patients make decisions they can live with, says Rush oncologist Philip Bonomi, M.D., associate professor of medicine.

Dr. Bonomi is planning to use a quality of life questionnaire in a nationwide clinical trial comparing three treatment plans for advanced lung cancer. This will be the first large-scale study to consider the effects of different cancer treatments on quality of life as well as on survival.

The estimated 300 patients to be enrolled in the study will be given either chemotherapy, or a synthetic female hormone called megestrol-acetate, or chemotherapy combined with the hormone treatment. Megestrol-acetate has been shown to improve appetite and—as a result—quality of life in some cancer patients.

According to Dr. Bonomi, oncologists are sharply divided over whether chemotherapy is useful for patients with advanced lung cancer, which is generally considered incurable.

The proposed study will follow-up on previous research suggesting that chemotherapy may help patients live longer. Results of that study were inconclusive, says Dr. Bonomi. But if chemotherapy is also shown to improve quality of life, that information could become an important piece of the puzzle for patients and doctors evaluating its desirability as a treatment.

"Most physicians have a lot of good anecdotal information about how a treatment is likely to affect a person's quality of life," says Dr. Bonomi. "But more formal research would provide a broader base of information than our own practices can provide."

Dr. Cella gives an example of how this might work. "Consider a treatment known to prolong life for 10 to 20 percent of the patients who try it," he says.

"Traditionally, patients would be given information about the treatment's effect on longevity. With quality of life data, you could also tell a patient that of the 80 percent who *didn't* live any longer, this was how easy—or difficult—it was for them to get around, to swallow food, to sleep, to have sex, to take care of their children, to go to work," he says.

"The bottom line is that no matter how much information patients have, making a decision about cancer treatment is difficult to do—even for people who become well versed in the risks and benefits of different treatments.

"It can be done, but it ultimately requires making value judgments," he says. "Quality of life research would help patients decide which trade-offs they're willing to make."

> ***"Research would help patients decide which trade-offs they're willing to make."***

Implications for the Future

Research on quality of life will become more prevalent as health care costs continue to rise while resources are limited, says Michael Counte, Ph.D., associate professor of health systems management at Rush.

"The question is, assuming that we can't provide everything to everyone, to whom should we provide what—and when?" he asks.

Dr. Counte predicts that quality of life will be an increasingly important factor in that equation.

"In the '80s the bottom line was cost. In the '90s it's going to be value—or quality—for money," Dr. Counte says.

He argues that this evolution in thinking will come about in large part because of changing demographics in the U.S.

The nation's population is aging rapidly. Within a couple of decades, the first of the Baby Boomers will celebrate their 65th birthdays. By the year 2050, there will be about 73 million Americans older than 65. That's twice as many as there are today.

At the same time, medical advances are extending life expectancy. The population of people over 85 is the fastest growing age group in the country.

As people live longer, they also experience more of the health problems that come with age. About 85 percent of the nation's non-institutionalized elderly have at least one chronic condition. Forty percent have two or more.

"Chronic disease, by definition, can't be cured," says Dr. Counte. "A person has to learn to live with it, to manage it. So at the policy-making level—even at the level of the individual physician—the key question has to be, 'If the result of this treatment can't be to cure disease, how are we going to measure its effectiveness?' Quite clearly, we have to move in the direction of health-related quality of life."

Dr. Counte was recently involved in a preliminary study to see what was most likely to influence the quality of life among people over the age of 65.

Participants were asked, "Generally, how satisfied are you with the way you are living now?"

Unexpectedly, researchers found that the best predictor of life satisfaction was the ability to perform daily activities—preparing meals, doing housework, going shopping, visiting friends.

This was more important than the number of health problems participants had during the six months preceding the study.

"What this tells us is that the presence or absence of illness is less important than the effect of illness on being able to get around," says Dr. Counte.

"It also may tell us something about appropriate interventions. It may suggest a need for increased funding for community outreach and rehabilitation programs promoting independence among the elderly.

"The fact is, we really don't know, so we need studies to evaluate whether existing programs do improve quality of life among the elderly," says Dr. Counte. "Because if they don't, what's the point?"

When the Phone Rings...

Poison Control Center experts answer calls around-the-clock.

by Justine Ringhofer

In a small fourth floor room at the Medical Center, toxicology experts work around-the-clock, saving as many as five lives a day from accidental poisonings. The single tool of their trade is not a stethoscope or a scalpel—it's a telephone.

An average of 150 calls a day reach the Rush Poison Control Center. As the official regional poison control center for Chicago and northeastern Illinois, it answers calls from two-thirds of the state's population. Dozens of books and journals reinforce the knowledge of the Center's five full-time staff members, while a computer database contains information on the chemical makeup of a half million different products. Seeing this small space so jammed with information could make a visitor wonder why it's all necessary—until the phone rings.

A call at 7:35 one Wednesday night came from a concerned medical resident on his first night in the emergency room of a southwest-side hospital. Two children, one-and-a-half-year-old playmates, swallowed so many iron tablets that they had become lethargic, a sign that the drugs were causing harm.

"The physician had already drawn blood to determine how much iron the children had in their systems—but he needed to know what the numbers meant," said poison information specialist Connie Fischbein, who took the call. "One child had 236 micrograms of iron per deciliter of blood, which is not an alarming level. But when the resident inserted a gastric tube to flush out the iron, blood came up, and that could mean a serious problem."

According to Fischbein, this signaled

Nearly two out of three calls to the Poison Control Center involve children under six years of age.

that the iron had already begun to corrode the stomach lining. Administering an antidote called deferoxamine would stop this process by binding the iron to help the body excrete it naturally.

"I instructed the physician to give the antidote to *both* children," said Fischbein. The second child needed it because his iron level had reached 435 micrograms, far above the 350 micrograms at which the antidote should be administered.

Approximately 15 minutes had elapsed from the time of the call until the situation was under control. Following the Center's policies, Fischbein checked back with the physician two hours after the incident and learned that the iron level of the more severely affected child had gone down to 329. Twenty-four hours later it dropped to 47. Forty-eight hours later both children were discharged.

Emergency room cases and accidental poisonings represent three out of four calls to the Center. Sixty-two percent of all calls involve youngsters under age six.

"We often have to calm down parents," says poison information specialist James Walsh, R.Ph. "All they know is that suddenly their pride and joy seems to be very sick. They're in a panic and they want to know what to do to make it okay. Sometimes it's not as severe as they think, and if they just call us, we might be able to stop them from making an unnecessary trip to the emergency room."

According to Jack Lipscomb, R.Ph., director of the Center, not only does his staff save lives—they also curb healthcare costs.

"Just last year, we prevented more than 8,000 unnecessary emergency room visits throughout the region that would have cost a total of about $2.1 million," he says.

Perhaps thousands of other cases are prevented because of a warning sticker—called "Mr. Yuk"—that the Center's staff distributes. A chartreuse face with eyes squinting, tongue protruding, Mr. Yuk warns children too young to read that the contents of a container are not to be swallowed.

"A lot of times, children are attracted by odors—such as lemon-scented furniture polish or a flavored medication," says Lipscomb.

"The thing to do when teaching children to stay away from certain products is to show them the Mr. Yuk sticker and explain what it means. Do not take your child on a tour of the house and point out where the dangerous products are kept. You do not want them to know that."

To Prevent Accidental Poisonings

- Store all medicine separately from household products. Keep all household cleaning products away from food and out of the reach of children.
- Keep items in original containers, with their original labels, so proper antidotes can be prescribed in case of accidental poisoning.
- Try not to take medicine in front of children: They tend to imitate adults.
- Clean out the medicine cabinet periodically. Flush all unwanted medicine down the toilet.
- Read medication labels carefully before taking.
- Keep all perfumes, colognes, cosmetics and contraceptives out of children's reach.
- Be aware that some plants can be poisonous. Identify all plants and remove those that are unsafe.
- Inspect all walls and windows for peeling paint.
- Keep the following items in safety containers and out of reach of children: gasoline, oil, antifreeze, bug spray, weed killer, fertilizer, charcoal lighter fluid, paint and paint thinner.

In case of an emergency, call the Rush Poison Control Center, 312-942-5969 or, outside the Chicago area, 1-800-942-5969.

Most calls involve household products such as laundry detergent, cat litter, artificial dyes or insect poison, but there are some slightly more unusual incidents.

"We recently got a call from the medical intensive care unit at Rush," said Walsh. "A northside man who kept a snake for a pet—a poisonous, copperhead snake—was bitten when he removed it from its cage."

"We pretty much depleted our supply of the anti-venom used to treat him," adds Lipscomb.

Several years ago, the Center's staff teamed up with emergency room physicians and pharmacists at Cook County and University of Illinois Hospitals to form a consortium called Toxikon.

"Toxikon is dedicated to making toxicology services more accessible to Illinois residents and advancing knowledge in this science among health professionals," says Lipscomb.

Medical directors are Jerrold B. Leikin, M.D., assistant professor of internal medicine at Rush, and Daniel Hryhorczuk, M.D., of Cook County Hospital, until recently the only two board-certified toxicologists in the state. With a grant from the Chicago Community Trust, the consortium established a fellowship to train medical doctors as toxicology specialists. The first "graduate" has become the third board-certified toxicologist in Illinois.

Toxikon research is aimed at early detection of poisoning clusters, such as the 1991 salmonella food poisoning that hit participants of a hardware convention in Chicago. Detailed records are kept of every incoming call. When several callers complain of the same symptoms, the documentation will alert the staff to a potential cluster.

"If we do detect a cluster, we will contact the Illinois Department of Public Health, then get information out to hospital emergency rooms that may receive victims, and issue warnings through public service announcements," said Lipscomb.

"It is essential that poisoning clusters be handled thoroughly and quickly. After all, we're dealing with a lot of lives."

Barcode Technology Enhances Patient Care

Barcoding technology at Rush has improved patient care by enabling more efficient handling of laboratory samples.

At Rush, the same technology that can tell the difference between a package of frozen spinach and French-cut green beans can distinguish you from the patient in the next bed—even if it's your twin sister.

A barcode is now assigned to everyone admitted to Presbyterian-St. Luke's Hospital. It's printed on wristbands, encoding each patient's number in the precisely configured thick and thin black lines familiar to all supermarket shoppers.

Rush has pioneered the use of barcoding among Chicago hospitals. Using barcodes on patient IDs is the latest result of efforts started some four years ago to improve the speed and accuracy of ordering, sorting and tracking laboratory samples.

> *"Automation in health care will go as far as our imagination and resources can take us."*

The Medical Center was involved in early efforts to develop national standards for the use of barcoding in American health care institutions.

"We became interested in the technology because it provides a quick and virtually error-free way to keep track of information that's crucial to patient care," says Suzanne Watt, M.T., assistant director, Office of Consolidated Laboratory Services.

The average person makes one transcription error for every 300 characters typed. With barcodes, such errors occur as rarely as one in every 36 trillion characters entered.

Barcodes make it possible to follow a test tube from the time blood is drawn until the sample reaches the right laboratory.

The process begins as a computer generates a set of barcoded labels for hospitalized patients who need laboratory tests. Each label encodes the sample's destination, the test to be done, special handling requirements, and any other pertinent information.

Using a hand-held scanner, health care workers can positively identify patients by comparing the barcode on a test tube label with the patient's wristband.

Samples are electronically sorted on a conveyor belt system that automatically slots them in bins for the appropriate laboratory. Those needing special handling are sorted separately.

"If we're supposed to draw six samples for a given patient and we only draw five, the computer will let us know one is missing," says Kenneth Whisler, Ph.D., director, Laboratory Information System.

"It can also tell us exactly when each step in the process took place, so we're able to identify where holdups occur."

The Medical Center has come a long way since it first looked into barcoding, but Watt admits that the system is still rudimentary.

"Currently, barcoding is being used on only 20 percent of the units. But there are plans for the technology to be on all hospital floors eventually," says Watt.

"We're also working on getting the system up and running in outpatient facilities, like the managed care programs and Rush Home Health," she says.

Watt sees tremendous potential for barcoding and other forms of automation in health care.

"Barcoding can be used for such things as electronically charting vital signs, locating charts for billing and record keeping, and recording how much of what drug was given to a patient—and when it was given," says Watt.

"I visited a hospital where barcoded samples were taken from laboratory to laboratory by a little robot that looked like something out of *Star Wars*," she adds. "Automation in health care will go as far as our imagination and resources can take us."—*M.M.*

Najafi Appointed to Endowed Chair

The Rush surgeon who performed Chicago's first successful adult heart transplant has been named the Mary and John Bent Professor of Cardiovascular-Thoracic Surgery.

Hassan Najafi, M.D., professor and chairman of the Department of Cardiovascular-Thoracic Surgery, was appointed to the chair that was recently designated to honor two longtime supporters of the Medical Center.

The internationally renowned heart surgeon is surgical director of the Rush Heart Institute.

Born in Iran, Dr. Najafi earned his medical degree in 1954 from Tehran University School of Medicine. In 1957, following a surgery residency at Pahlavi University Hospital in Tehran, he came to the United States.

Dr. Najafi completed residencies in general surgery and cardiovascular-thoracic surgery at Presbyterian-St. Luke's Hospital in 1963 and subsequently joined the medical staff. In 1968, he performed a successful heart transplant—the first in Chicago—on a 50-year-old man from south suburban Stickney. Dr. Najafi has been chairman of cardiovascular-thoracic surgery since 1972.

He is associate editor of *Annals of Thoracic Surgery* and a member of the editorial boards of *Chest* and the *Journal of Cardiac Surgery*.

His past appointments include terms as president of the Society of Thoracic Surgeons and the Chicago Surgical Society, and as director of the American Board of Thoracic Surgery. He has published more than 100 scientific papers.

Hassan Najafi, M.D. (left), with Life Trustee John Bent.

John and Mary Bent have been involved in Medical Center activities for more than 40 years.

John Bent was elected to the Board of Trustees at St. Luke's Hospital in 1948, and served as president of the board of Presbyterian-St. Luke's Hospital from 1962 until 1964. He has been a life trustee of the Medical Center since 1976.

Both Mr. and Mrs. Bent are members of the Board of Benefactors of the Medical Center. In addition to their philanthropic commitment to the Rush Heart Institute, they have helped endow several other chairs for Rush University.—*S.J.*

Bone Elected Vice President, Dean

Roger C. Bone, M.D., the Ralph C. Brown, M.D., Professor, chairman of the Department of Medicine, and chief of the Section of Pulmonary Medicine, has been elected vice president for medical affairs and dean of Rush Medical College by the Board of Trustees.

Dr. Bone had served as interim vice president for medical affairs and acting dean of Rush Medical College since April 1991.

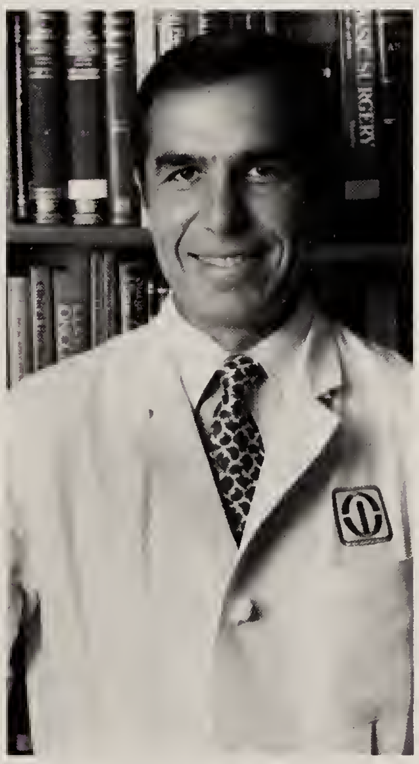
An internationally recognized authority in critical care and pulmonary medicine, Dr. Bone joined the staff of the Medical Center as chairman of medicine in 1984.

Dr. Bone, a native of Arkansas, is an honors graduate of Hendrix College. He earned his B.M.S. and doctor of medicine degree (and election to Alpha Omega Alpha) at the University of Arkansas Medical School. After completing an internship and residency at Parkland Memorial Hospital in Dallas, Texas, he took a fellowship in cardiopulmonary medicine at the University of Texas Southwestern Medical School in Dallas.

He later held faculty positions at the University of Kansas Medical Center and the University of Arkansas for Medical Sciences—Veterans Administration Complex, where he was also chief of the pulmonary division.

Dr. Bone is president of the American College of Chest Physicians and of the International Academy of Chest Physicians and Surgeons.

He has published nearly 600 scientific articles, including data from more than 150 original investigations, and has edited more than 30 books on pulmonary and respiratory disease.


Roger C. Bone, M.D.

He is a consulting editor of the *Journal of the American Medical Association*, senior editor of *Critical Care Medicine*, and editor-in-chief of *Disease-A-Month*.—*P.R.*

RADC Designated National Center

The Rush Alzheimer's Disease Center (RADC) has been designated a national Alzheimer's Disease Center by the National Institute on Aging of the National Institutes of Health.

The designation carries with it a five-year, $3.2 million grant. Denis A. Evans, M.D., the Alla V. and Solomon Jesmer Professor of Gerontology and Geriatric Medicine, and director of the Center for Research on Health and Aging, is principal investigator.

The award will support the care and study of people with Alzheimer's disease, neuropathological studies, and efforts to increase awareness of the disease among health care professionals and the public.

The RADC joins the ranks of 28 similar centers established across the country.
—*P.R.*

Taxol Shows Promise, Fuels Controversy

Since chemotherapy was first used to fight cancer in the late 1940s, there has been an ongoing quest for better chemotherapeutic agents. And each decade—as dozens of drugs are tested—one stands out as more promising than the rest.

In the 1990s, taxol may be that agent of promise. But while early results have been encouraging, the use of taxol—which comes from the bark of the rare, slow-growing Pacific yew tree—has also sparked a debate. Will the environmental cost be too high?

First, the case for taxol.

"Taxol is a different class of drug. It's really the most promising new chemotherapy agent since VP 16 (etoposide) in the 1980s and cisplatin in the 1970s," says Philip Bonomi, M.D., associate professor of medicine and senior attending physician. Cisplatin and VP 16 are standard treatments today.

In early clinical trials, taxol appears effective in treating a variety of advanced cancers that have not responded to conventional treatment.

Taxol's antitumor mechanism is not completely understood. Scientists believe taxol works by attaching to cellular structures, called *microtubules*, that form the cell's skeleton and play a crucial role in cell division.

Dr. Bonomi has used taxol to treat a handful of patients with advanced lung cancer. "Because there is no good screening test for lung cancer, most of our patients are at an advanced stage of the disease when we first see them. So anything that shows promise is exciting to us," he says.

"We were also intrigued because taxol was first shown to be effective against ovarian cancer, which had become unresponsive to cisplatin."

Dr. Bonomi and his colleagues in the Eastern Cooperative Oncology Group are developing a study in which cisplatin and taxol will be combined to treat advanced lung cancer.

Samuel G. Taylor IV, M.D., professor of medicine and associate attending physician, has treated head and neck cancer patients with taxol. "We've seen mass lesions shrink with a promising degree of frequency," he says.

Taxol has been tested in a small number of cancer patients around the country.

Until last year, only about 1,600 patients had been enrolled in initial clinical trials of taxol. Expanded trials and a compassionate use program (for ovarian cancer patients only) were launched last fall.

According to the National Cancer Institute, it takes between three and six trees to obtain enough taxol to treat each patient. This latest effort requires the annual harvest of an estimated 38,000 trees to produce enough taxol for some 12,500 patients nationwide.

Environmentalists fear this wider use of taxol could decimate the yew tree forests, particularly those with larger, older trees.

They argue that harvesting large numbers of Pacific yews will upset the forests' ecological balance, destroying the habitat of the endangered spotted owl and other animals.

This concern is not lost on medical researchers. Efforts are under way in the U.S. and abroad to find cost-effective ways to produce taxol while saving the trees: from needles rather than bark, from a more common species than the Pacific yew, through tissue cultures of yew cells or through some other form of synthesis. By some estimates, as many as 30 research groups are working to synthesize taxol.

"I believe that this or other drugs comparable to it will be synthesized in the next few years," says an optimistic Dr. Taylor. "But it's important that clinical studies continue. We need to clearly define the usefulness of this substance as a cancer therapy."—*C.R.*

> ***"We need to clearly define the usefulness of this substance as a cancer therapy."***

Samuel G. Taylor IV, M.D., is one of a few physicians nationwide who has tested the cancer-killing power of taxol.

Pedaling To Health

There are more than 400,000 documented strokes in the U.S. every year. After traditional rehabilitation, which focuses on strengthening and improving the flexibility of affected muscles, stroke patients still may fall short of what they once were able to accomplish in a day.

Traditional rehabilitation doesn't do enough, say Rush researchers who are testing a new treatment plan. Their plan builds on traditional rehabilitation with a program of aerobic exercise on a stationary bicycle.

Co-investigators are Lynne Braun, Ph.D., assistant professor of medical nursing at Rush; Martita Lopez, Ph.D., assistant professor of psychology and social sciences; and Kathleen Potempa, D.N.Sc., R.N., assistant professor of nursing, University of Illinois at Chicago. Dr. Braun is the project director.

"After standard rehabilitation, patients typically reach a plateau," says Dr. Potempa. "They can get around with some assistance—and they feel that's all they will ever be able to do. This feeling of helplessness can make them fearful of tackling any new challenges. As a result, their physical abilities decline.

"We hope patients will become more active through aerobic rehabilitation and maintain their activity level, even if they don't continue a structured exercise program."

About 30 people are enrolled in the study, now in its third year. They have at least moderate difficulty moving around, as well as low stamina. Most participants are about 60 years old, but some are as young as the late 30s and others as old as 70.

A stationary bicycle is part of an experimental rehabilitation plan for people who have suffered strokes.

When they begin the study, participants are tested for endurance and the ability to perform everyday tasks.

They then begin an exercise routine using a stationary bicycle that can be adapted to handicaps caused by stroke, such as right-limb paralysis.

The initial tests are repeated after the first 10 weeks, then every 10 weeks until patients have completed a year in the study. Results will be compared to those for patients receiving only traditional rehabilitation.

The researchers are also looking at whether patients improve psychologically.

Forty percent of the study participants showed signs of depression—a common problem for stroke patients, which often leads to inactivity. "We believe that as patients' physical abilities improve, so will their moods," says Dr. Lopez.

"Patients enjoy being in the study, not just for the physical benefits, but because participation relieves stress and provides a social outlet."—*J.R.*

Center Is Haven Between Hospital and Home

Many people hospitalized for psychiatric problems are afraid to leave the safe hospital environment to return to the "real world."

Rush now offers a place that eases the transition to home or work for patients recovering from depression and other mental illnesses.

The Rush Residential Center, located in a low-rise apartment complex a few blocks east of Presbyterian-St. Luke's Hospital, is the only one of its kind in the Chicago area.

Studies have shown that residential living can be a beneficial alternative to hospitalization for mental health rehabilitation. Research in California has found that psychiatric patients who take advantage of this type of care are less likely to be hospitalized later.

> ***"Being here with others who have lived through depression has made the difference."***

"At Rush, residential treatment is integrated with patients' medical treatment. It's a continuum of care after hospitalization," explains Gwynne Winsberg, Ph.D., director of residential psychiatric services.

The center includes single and double rooms for up to eight residents. They share common areas, including a music room, dining room, exercise/TV room, snack bar, library and kitchen.

Most residents attend hospital day programs and participate in group therapy sessions. They see their psychotherapists every week at Presbyterian-St. Luke's Hospital.

According to live-in house manager Mark Contorno, there isn't a "typical" day at the center. "We have a routine, but residents come and go freely," he says. "For those not in a day program, there is volunteer work in the community, independent study or class work."

Residents go out to dinner, see movies and plays, visit family, and invite friends in to watch movies. After dinner on Mondays, they meet to air concerns and discuss weekly schedules. "We're family. We do things together," says Contorno.

"One of our goals is to help residents develop and expand their unique skills and talents," adds Dr. Winsberg.

"When they can produce something of value—be it a tasty Italian dish, a well-tuned car or a painting—it represents a significant part of recovering.

"We encourage the people who live here to be active and to focus on what's good about them, rather than what's wrong with them. This is one way they gain independence," she says.

Residents agree that communal living has helped them get well. Says one woman, "Group therapy is useful, but being here with others who have lived through depression has made the difference."
—*C.E.*

Rush and Holy Family Sign Venture Agreement

Seated: Leo M. Henikoff, M.D., president and CEO of the Medical Center; Sister Patricia Ann, president and CEO of Holy Family Hospital. Standing: Richard M. Morrow, chairman of the Rush Board of Trustees; Sister M. Lucille Madura, Provincial Superior of the Sisters of the Holy Family of Nazareth.

Rush-Presbyterian-St. Luke's Medical Center and Holy Family Hospital in Des Plaines have entered into a venture agreement to enhance medical services in the northwest suburbs.

Under the agreement, the two institutions will remain autonomous. Holy Family Hospital will maintain its name, mission and Catholic identity, and will continue to be operated by the Sisters of the Holy Family of Nazareth.

There will, however, be an exchange of trustees between the two institutions, improved access for Holy Family physicians and their patients to the tertiary care services at Rush, and enhanced integration and delivery of Rush's managed care programs to the northwest suburbs.

The chairpersons of the clinical departments at Holy Family will be jointly approved by both institutions. They will be given faculty appointments and be associate chairpersons at Rush Medical College.

Holy Family has appointed Kenneth Schmidt, M.D., to the position of vice president of medical affairs, a position created under the terms of the agreement. Dr. Schmidt, a board-certified radiologist on staff at Holy Family, will hold the position of associate dean at Rush Medical College.

Holy Family Hospital is a 277-bed, not-for-profit, acute care community hospital founded in 1961 by the Sisters of the Holy Family of Nazareth.

Cesarean Rate Rises Among Teens

The rate of cesarean births is increasing faster among Illinois teens than any other age group in the state, according to a study completed by researchers at the Rush Center for Health Management Studies. From 1986 to 1988, while the overall rate of cesareans remained stable, the rate for teens rose by more than four percent.

> *"If cesarean rates among teens continue to rise, it could have a snowball effect."*

"Women over the age of 35 still account for most cesarean deliveries," says Denise Oleske, Ph.D., assistant professor, health systems management. "But there are more women under the age of 20 having babies than women over 35.

"If cesarean rates among teens continue to rise, it could have a snowball effect," says Dr. Oleske.

"A woman who has a cesarean with her first baby is more likely than not to have one with later births. So the increase in these deliveries among women at the beginning of their reproductive lives increases the population at risk for subsequent cesareans, which are about twice as costly and require longer hospital stays than vaginal deliveries," she says.

"Further, cesarean deliveries are associated with higher rates of complications for mothers and babies."

Dr. Oleske completed the study with Gerald L. Glandon, Ph.D., associate professor, health systems management.

Their findings agree with national statistics showing that from 1970 to 1987 the increase in cesarean births—or c-sections—was greater among teenagers than any other group of American women.

A c-section may be deemed necessary because of the physical condition of a mother and/or child at the time of delivery. Doctors may perform the operation because of fetal distress, breech position, an undilated cervix or other factors that can make vaginal delivery difficult or dangerous.

Research has shown that nonmedical factors may also influence the decision. These include a woman's socioeconomic status, source of health insurance, and whether she delivers at a teaching or non-

Denise M. Oleske, Ph.D.

teaching hospital. There's evidence that a woman is less likely to undergo a c-section at a teaching hospital.

Drs. Glandon and Oleske made a surprising discovery when they reviewed data on teenagers delivering at state hospitals in 1988. Even when accounting for medical complications and the type of hospital where deliveries took place, they found that Medicaid teens were 18 percent more likely to undergo a c-section than teens with HMO coverage, teens covered by private insurance, or those without any form of insurance.

These results contradict previous research showing that privately insured patients have the most cesarean births.

"Why is Medicaid coverage now a risk factor for cesarean birth when it never was in the past?" asks Dr. Oleske.

She and Dr. Glandon speculate that recently expanded Medicaid coverage may be a financial incentive to perform the operation.

"In future studies, we will also look at whether Medicaid coverage is, in fact, an indicator of limited access to quality prenatal care," says Dr. Oleske.

Drs. Oleske and Glandon urge increased efforts to provide pregnant teens with medical care early in pregnancy.

They also recommend that Medicaid programs throughout the U.S. be aggressive in their application of second opinion programs and in reviewing cesarean rates for hospitals and individual physicians.

"This will require a team effort of physicians, consumers, health care researchers, payers and the government," says Dr. Oleske. "Together, our goal should be to keep costs down while ensuring that patients receive the best obstetric care possible."—*B.H.*

Linda Brubaker, M.D., counsels patients on ways to prevent the loss of bladder control.

Detecting Early Signs of Incontinence

Incontinence, or loss of bladder control, plagues 10 to 15 million women at some point in their lives. Now there's evidence that underlying pelvic nerve and muscle damage can be detected—and treated—before bladder control problems start.

Incontinence is more common after menopause, but experts suspect that nerve and muscle deterioration start years earlier, perhaps with childbirth.

"Up to 80 percent of women may sustain pelvic nerve damage during delivery," says urogynecologist Linda Brubaker, M.D., assistant professor, obstetrics and gynecology. "One theory is that over time, as muscles maintained by the damaged nerves are progressively weakened by estrogen loss, problems with bladder control can result."

Dr. Brubaker is searching for ways to detect early signs of nerve damage. Using an investigational technique that measures nerve impulses, she assesses pelvic nerve function. Patients showing signs of damage are taught how to maintain pelvic muscle strength through exercise, to prevent incontinence from developing later in life.

"Incontinence is treatable. But considering the embarrassment patients suffer before they get help, prevention should be a priority," says Dr. Brubaker.

Dr. Brubaker refers patients to Rhonda Kotarinos, M.S., P.T., a physical therapist who specializes in obstetrics and gynecology, for evaluation and treatment of the problem.

Kotarinos visits new mothers in their hospital rooms, shortly after childbirth. "Anyone can develop incontinence, but bearing children puts women at higher risk. Many experience bladder control problems while pregnant," she explains.

Kotarinos teaches women how to perform muscle-strengthening pelvic exercises. For women with early incontinence or signs of extensive nerve and muscle damage, she may prescribe mild electrical stimulation along with exercise.

"If a patient can't contract her pelvic muscles, she can't exercise them. In the early stages of treatment, a tampon-like electrical stimulator is used to cause contractions during exercise," Kotarinos explains.

For some incontinent patients, surgery provides the best chance for cure. "But for many patients, nonsurgical treatments are very effective," Dr. Brubaker says.

"It's important for women to recognize that incontinence isn't a natural result of childbirth or even a natural result of aging," she concludes. "Too many women think it's something they must learn to live with. It's not."—*C.J.*

RUSHROUNDS

Board Elects New Members, Life Trustees

William G. Brown

Holly Williams Madigan

Anne O'Laughlin Scott

Carole Segal

John J. Shea

The Board of Trustees of the Medical Center has elected five new members and seven life trustees. Richard M. Morrow, chairman of the board, made the announcements.

The new members include four general trustees:

William G. Brown, a partner in the law firm of Bell, Boyd and Lloyd, and a director of Medicus Systems Corporation and McNerney Heintz, Inc.; the Honorable Anne O'Laughlin Scott, who recently retired from the bench as an associate judge of the Circuit Court of Cook County; Carole Segal, vice-president and cofounder of Crate and Barrel, and founder and former CEO of Foodstuffs; and John J. Shea, vice-chairman, president and CEO of Spiegel, Inc.

Holly Williams Madigan, president elect of the Woman's Board, was elected an annual trustee.

Newly elected life trustees are Mrs. Frederick M. Allen, Mrs. Bowen Blair, Richard G. Cline, Mrs. Edward Hines, Thomas J. Klutznick, Mrs. F. Richard Meyer III and Robert A. Southern.

Other actions of the board include the appointment of James W. DeYoung to the Executive Committee. DeYoung, recently elected chairman of the board of Rush Health Plans, is president of Winston Partners, Inc. He has been a member of the Board of Trustees since 1977.

A New Choice for Pregnant Women with Kidney Disease

Last August, 30-year-old Jacquelyn Marrone beat the odds when she gave birth to her first child—a healthy son named Stephen.

Marrone suffers from chronic kidney disease. For women with her condition, pregnancy poses serious health risks.

Both mother and fetus are in danger of blood poisoning by urinary acids. The risk is very high for premature delivery—and all the medical complications the newborn may suffer as a result. Hypertension in the mother may become so severe that it triggers seizures and blackouts, and may even lead to her death.

Pregnancy can accelerate deterioration of the kidneys and, for some women, can hasten the need for dialysis—the mechanical process of removing poisons from blood when kidneys have failed. For these women, dialysis is a stopgap until a kidney transplant can take place.

Not long ago, physicians usually recommended terminating these difficult pregnancies. Today, with proper care and supervision, kidney patients have a better chance of giving birth.

Susan Hou, M.D., assistant professor of internal medicine, is an expert in the field of pregnancy in kidney patients.

Her experience suggests dialysis may improve the prospects for delivering a healthy baby.

"For women on dialysis who become pregnant, the success rate for childbirth is about 50 percent," she says. "For kidney patients who begin dialysis *after* becoming pregnant, the success rate jumps to 86 percent."

When Jacquelyn Marrone became pregnant, she discussed her options with Dr. Hou and decided to start on dialysis.

"Pregnancy is a full-time job for someone with my disease," says Marrone. "But I've always wanted a baby, and Dr. Hou was there for me."

Dr. Hou emphasizes that even with the best of care, pregnancy remains risky for women with kidney disease.

Many expectant mothers control blood pressure and calcium levels with medication. Most women with kidney disease need to use home uterine monitoring equipment to detect premature labor. With early detection and treatment, labor can be stopped before it leads to premature birth, the most common cause of death in these babies.

In certain cases, once the baby is born, mothers who started dialysis after becoming pregnant will no longer need it. "If the mother's kidney function has not worsened, she can stop dialysis," says Dr. Hou.

Dr. Hou is now developing a national registry for pregnant women on dialysis.

"The information from the registry can help us design studies to see what kinds of interventions seem to help for the problems these patients face," she says.—*S.J.*

What Memories Are Made Of

Amnesia can be a powerful weapon against memories that are too painful to recall. But what of these repressed memories? Are they reliable accounts of events or are they distorted recollections, nevertheless perceived as real?

These questions were addressed last November at the Rush Department of Psychiatry's Eighth International Conference on Multiple Personality/Dissociative States.

Speakers included Elizabeth Loftus, Ph.D., from the University of Washington, Seattle, whose research suggests that the tendency to edit and embellish recollections is natural.

In her studies, psychologically normal subjects were shown a movie of a simulated accident and then given misinformation. For example, when questioned about what they saw, they were asked, "What happened when the car drove past the barn?" even though no barn was present in the simulation. When later asked to describe the accident, the misinformation consistently appeared in a significant number of the subjects' accounts.

Does misinformation influence memory traces? Answering this, says Dr. Loftus, could offer insights into the reliability of memories uncovered after years of repression. What's more, such knowledge could sway the ongoing legal debate over victims' rights to sue for damages on the basis of memories uncovered years after alleged abuse.

Dissociation—or mentally removing oneself from a situation—is one of the mind's natural defenses. But when triggered by severe, repeated physical or psychological abuse, this defense system sometimes goes awry. Memory loss is intrinsic to dissociative disorders, which encompass a range of related psychological disturbances, most notably multiple personality disorder.

"We're looking at how memories are created and how dissociative disorder-related memory deficits occur," says Edward J. Frischholz, Ph.D., research associate for the Dissociative Disorders Program at Rush.

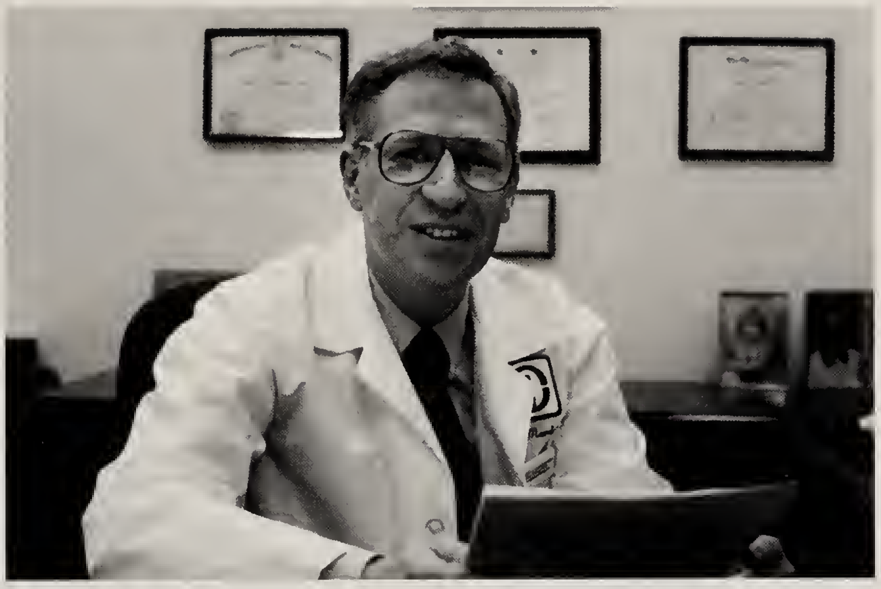
"It may be that trauma makes people particularly susceptible to distorting influences," he says. "If so, we need to learn when and why distortion occurs."

Memory has three parts. First, information is registered, or encoded. Next, it's transferred to long-term memory, where it's stored. Finally, information is retrieved, or reproduced by the mind in the form of a recollection.

Until recently, it's been thought that dissociative disorders involve storage and/or retrieval problems. But, says Dr. Frischholz, evidence now suggests problems may also arise during encoding. If so, underlying memory traces—often assumed to possess a photograph-like accuracy—may themselves be distorted.

"But to patients, these uncovered memories, distorted or not, remain very real," says Bennett G. Braun, M.D., director of the Dissociative Disorders Program and program director of the conference.

"As therapists, we walk a fine line. We have to be supportive as our patients deal with their memories of the past, but we need to bear in mind that everything they remember is not necessarily objective truth."—*C.J.*



Robert J. Marder, M.D.

Marder Leads Medical Staff Quality Program

Robert J. Marder, M.D., has been named medical director for quality management at Rush. In this new position, he coordinates medical staff efforts to monitor, assess and improve patient care.

Dr. Marder, a 1977 graduate of Rush Medical College, joined the staff in August 1991 after serving three years as a project director for the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) in the Division of Research and Standards.

JCAHO is the principal organization charged with accrediting the nation's health care facilities.

While at JCAHO, Dr. Marder played a key role in defining hospital performance measures as part of the commission's long-term strategic plan for health care, called the "Agenda for Change." That agenda, says Dr. Marder, is based on concepts at the core of the Total Quality Management program that has been in place at Rush for the last four years.

"Rush is in an extremely strong position to meet these new standards," says Dr. Marder. "Many hospitals are just beginning to understand the concept of continuous quality improvement. Rush is well along the way.

"Prior to my coming to Rush, the medical staff had an active quality assurance program," he says. "What I bring to the process is the ability to help the staff ask the right questions: What are we trying to measure? How should we measure it? What are we going to do with the information? My goal is to encourage physicians to be problem solvers, not data collectors."

Dr. Marder is working with Cynthia Schripsema, M.S., R.N., director of quality assessment and improvement, to coordinate data collection resources for the medical staff as well as for nursing and ancillary services. They are also working together to promote interdisciplinary quality improvement efforts around the Medical Center.

"Ultimately, it's the people who take care of patients who will make the improvements," says Dr. Marder. "My job is to put in place systems that will enable them to do that more easily."—*M.M.*

Paul Fairchild made a 200-mile bicycle trek after undergoing corrective surgery at Rush for scoliosis.

Going the Distance After Back Surgery

Hunched over his touring bicycle, Paul Fairchild rode 200 miles from his hometown of Milan, Michigan, to West Branch last August. Over the course of the two-and-a-half-day trek, he averaged nearly 15 miles an hour.

"I still can't believe I did it. Ten years ago, I found it difficult to take long walks, let alone ride a bike," he says.

The 43-year-old machinist could not have made the journey before undergoing corrective surgery at Rush for scoliosis.

He was first diagnosed with the condition, which causes the spine to curve sideways, at age 12. Early signs of the deformity in children are uneven shoulders or hips, a protruding shoulder blade, or a head that tilts slightly to one side.

Fairchild's condition worsened over time. By age 35, his spine had curved so much that it resembled a sharp "S."

"When my three-year-old son cried, it was hard for me to pick him up," he recalls. "I couldn't exercise, go bike riding or play softball in the spring. Lifting, bending and walking were torture."

Every specialist he consulted told him surgery wouldn't help his severely deformed spine. Worse, they predicted he'd be wheelchair bound by the age of 45.

Fairchild refused to give up hope. In August of 1985, he heard through a local scoliosis association about a corrective operation and was referred to Ronald L. DeWald, M.D., professor of orthopedic surgery at Rush.

A pioneer in the treatment of patients with debilitating spinal conditions, Dr. DeWald performed surgery to realign Fairchild's crooked spine in the spring of 1986.

Fairchild was hospitalized for 11 days, and returned to his job only two months after surgery. Like many spine patients, he wore an upper-body brace for a year. Though it took several years for him to regain full mobility, today a slightly protruding right shoulder blade is the only reminder of the condition that gave him excruciating pain for 25 years.

"Twenty years ago, people who underwent spine surgery spent up to nine months recuperating in the hospital," says Dr. DeWald. "Most of them were treated preoperatively with traction, plastic casts and heavy metal braces that are now obsolete."

Better anesthesia and improved spinal implants have revolutionized the specialty, notes Dr. DeWald. In addition, technological advances such as CT scans and magnetic resonance imaging have made the surgeon's job easier.

How did Fairchild know his operation was a success? "Before I went into surgery, I looked straight into my wife's eyes," he says. "When I stood up for the first time three days later, I was an inch and a half taller and looked down on the top of her head."*—B.H.*

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Fall 1992

Discovering Secrets of the Sandman

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Discovering Secrets of the Sandman

by Sue Jeantheau and Cheryl Janusz

Folklore brought us the tale of the sandman—the spirit who sprinkled sand in the eyes of children, causing them to fall asleep. If only the explanation for sleep were that simple.

We spend one-third of our lifetimes sleeping, yet we still have more questions than answers about why we sleep, how we sleep and what makes us fall asleep. Only recently have we begun to discover the secrets of the sandman.

As the door to understanding sleep is being cracked open, we are finding that sleep may answer a lot of questions about why the body functions the way it does.

"In the past few decades, studies have shown that the body's organs and systems behave differently in sleep. Before then, research in medicine generally was conducted with the body in a waking state," says Ruzica K. Ristanovic, M.D., assistant professor of neurological sciences and medical director of the Rush Sleep Disorder Service and Research Center.

Some researchers believe that, as a result of human evolution, certain internal processes are performed specifically during sleep to prime the body for proper functioning the next day.

"In a sense, sleep is a time of fasting. When we're sleeping, we are not really taking in nutrients. But our body needs to maintain energy levels for metabolic processes it performs during sleep," says Saul A. Rothenberg, Ph.D., assistant professor of psychology and social sciences and laboratory director of the Rush Sleep Disorder Service and Research Center.

The nighttime release of various hormones may unleash stores of energy, providing the boost the body needs to continue with its work of digestion, respiration, circulation, tissue growth and other internal processes.

Sleep and the Immune System

Sleep also may have a positive impact on the immune system. "It may be that sleep is a special time for the brain and the immune system to 'converse,' and that's one of the benefits of sleep," says Dr. Rothenberg.

When we first fall asleep, the body releases growth hormone, which some researchers suggest enhances immune system function.

"The immune system's tuned up at the beginning of the night to clean the slate from the day's exposure to harmful organisms," says Dr. Rothenberg.

While growth hormone sparks immune system function, stress hormones inhibit it. Stress hormones are released during waking to help mobilize defenses in arousing situations. But during sleep, they may work to modulate the effects of growth hormone released earlier in the night. In normal amounts, stress hormones released during our slumber may prevent the overactivation of immune mechanisms—which can be harmful—and can help return the body to a proper state of immune readiness to face the day's invaders.

> ***"It may be that sleep is a special time for the brain and the immune system to 'converse'..."***

Consider what happens to the immune system in an extreme case, such as when we get sick. When germs, viruses or bacteria invade, the body responds by releasing protector substances to ward off illness or infection. But is it the invaders or the immune system's response to them that leads to the behavioral changes we experience—such as the increased need for sleep?

Some sleep experts and immunologists suggest that it is not the "bug" but the activation of the immune system that causes the fatigue, the change in body temperature and the overall perception of cloudiness that lull us toward sleep and, perhaps, eventually back to health.

"During the day, we sleep for hours. Then, we go to sleep again at our normal bedtime and sleep all night. If we ever tried to sleep that much when we weren't sick, we would never be able to do it," says Dr. Rothenberg.

Cycles of Sleep

While we sleep, our body systems may run on low power, but they do still run.

From the time we hit the pillow at night until the time we open our eyes in the morning, body temperature, respiration, heart rate, and eye and body movement all fluctuate in a patterned way.

We can compare the body's response at the outset of sleep with a typical office at 5 p.m. Initially, the body winds down, similar to the way in which we prepare to leave the office. We turn down the thermostat and turn off lights, one by one. Only the dull hum of the mainframe computer system lingers.

Then, later in the night, like the custodian who flicks on the lights to do the evening's work, the body revives and reactivates itself—whirring through its regular functions as if we were fully awake. And the cycle repeats.

While we don't have a full understanding of how we fall asleep, we do know the brain is responsible. Two things happen. Brain mechanisms turn off the system in the brainstem that keeps us awake and turn on a second system that triggers sleep.

In eight hours, we might experience three to four cycles of what's known as "quiet sleep" with dreams in between. Quiet sleep, which consists of four stages of gradually deeper sleep, is what most of us think of when we use the word "sleep." This quiet sleep generally lasts about 90 minutes per cycle.

We start with two stages of quiet light sleep. In Stage 1, we just begin to doze and could be aroused to wakefulness by a loud noise or by a bed partner's nudging. We cannot be as easily awakened in Stage 2 sleep. In this stage, brain waves become slightly slower as we fall into full unconsciousness. Our body temperature begins to drop, and our heart and respiratory rates begin to slow.

From light sleep, we progress to two stages of quiet deep sleep—Stages 3 and 4. Brain waves become much slower as we pass through Stages 2 and 3 to Stage 4, the deepest stage of sleep. In these deep sleep stages, eye movements stop, heart and respiratory rates slow further, and blood pressure and body temperature continue to fall.

From Stage 4, we may slip back into a light stage of sleep, perhaps even waking up for a few seconds to roll over. Then, from that brief moment in light sleep, we move into dreaming.

Dreaming occurs during rapid eye movement—or REM—sleep. Individual REM periods vary in length, though they tend to last longer toward the end of a night's slumber and total about two hours.

During REM sleep the body responds as if fully awake but without moving. Brain waves rebound and become short and rapid. Heart and respiratory rates become erratic. Temperature rises. And we lie in a paralytic state "watching" a series of images through our rapidly moving eyes.

Mystery of REM

"One of the biggest mysteries is why, after quiet sleep, the body suddenly expends a lot of energy and increases its rate of activity. Why do we do that deep, relaxed, low-temperature stuff and then reverse so abruptly every night?" asks Rosalind D. Cartwright, Ph.D., director of the Rush Sleep Disorder Service and Research Center and chairperson of the Department of Psychology and Social Sciences.

REM originates in the brain stem. Nerves in the brain stem fire impulses up to other processing centers in the brain, some of which interpret the visual images we "see."

Too much sleep—hence, too much REM—or too little sleep and too little REM can cause problems.

"If you miss either the deep sleep or the REM sleep, you don't feel as though you've had a good night. They both seem to be important for us to feel and function well," says Dr. Cartwright.

"When REM loss is chronic, there can be serious daytime repercussions," says Cynthia L. Comella, M.D., assistant professor of neurological sciences at Rush. That was what she found in her research on patients with Parkinson's

The Sleep Laboratory

To allow researchers to study the changes that occur in the body during sleep, scientists developed special laboratories. The labs also make it possible for researchers to analyze and treat sleep disorders—conditions related to sleep or lack of sleep.

Today, there are more than 200 accredited sleep laboratories in the United States. Rush opened its own lab, one of the first in the country, in 1978.

Sleep laboratories feature two areas—a patient room and an instrumentation room.

In the patient room, technicians tape electrodes—wired to the instrumentation room—to the sleeper's scalp, beside the eyes and, sometimes, on the chest and limbs. Mounted to the ceiling in the patient room is a video camera focused on the sleeper's bed. Next to the bed is an intercom system that allows the researcher and the sleeper to communicate. For dream research, sleepers are awakened by this system after each REM sleep period to report their dreams.

In the instrumentation room, television monitors display the sleeper in bed, and video cassette recorders tape the sleeper's movements and breathing sounds. Technicians use a polysomnograph to measure brain wave, eye and muscle activity. This electronic equipment monitors and records from 8 to 16 different physiologic responses during a night's sleep. *—S.J.*

disease. For some patients, medications that improved their limited mobility also disturbed their sleep, depriving them of REM. In the most serious cases, patients had waking hallucinations.

But too much REM sleep is hard on the heart, says Dr. Cartwright. "The heart races and slows, just like respiration—the more REM, the more irregular heart rhythms."

Studies also show that sleep that is interrupted can have the same effect as no sleep at all.

That's the case with a sleep disorder called apnea. People with apnea have trouble breathing when they sleep. Their respiration stops for brief periods of time during the night—especially during REM. As a result, they wake up periodically to catch their breath.

"People with apnea can't get up in the morning because they're too tired, so they go to bed early. But they're still not rested after 10 hours of sleep," says Dr. Cartwright. "They have been working too hard all night to maintain respiration."

Getting Enough Sleep

We need a certain number of hours of sleep each night. Though Mom may have said eight hours of sleep a night is best, the amount that is right for you is something only you can determine. According to Dr. Rothenberg, the rule of thumb is that we need enough sleep to function well and not be sleepy when we're awake.

So, how do we know if we've slept enough?

Take the weekend test. Go to sleep on Friday night and turn off the alarm clock. If you find you feel better on Saturday because you've slept a little longer than usual, then you needed that extra sleep. And you probably should go to bed earlier on weeknights to get it.

"Some of the recent research has shown that starting in late adolescent life and continuing until much later than we want to admit to ourselves,

Our bodies won't let us go too long without sleep.

we need more sleep than we are getting. We seem to be a sleep-deprived country," says Dr. Rothenberg.

For many of us, there are never enough hours in a day to get things done. Sometimes we skip sleep just to finish what we need or want to do.

As children, we stayed up late for Santa Claus. In college, we studied all night for final exams. On vacation trips, we've waited until the last minute to head home.

But the tired child becomes irritable, whiny and overbearing. The student who survives the early morning exam may sleep through afternoon lectures. And the vacationer driving home in the middle of the night may doze at the wheel and have an accident on the expressway.

We can't go for days and days without any sleep simply because our bodies won't let us. But we can handle small fluctuations in our sleep routine, such as losing a few hours here and there. Our arousal system usually enables us to focus at work and stay alert on long drives home when we've been short on sleep. In a sense, we can program ourselves to run on overdrive, but not without a price. Long-term cheating on sleep can become a tough habit to break.

"If we're used to evoking our arousal system to compensate for insufficient sleep, there's going to come a time when we'll want to turn off that system in order to sleep. And that's not always easy to do," Dr. Rothenberg says.

The difficulty lies in reprogramming ourselves. Catching up on sleep requires finding more time to sleep and learning how to unwind enough to be able to sleep. Eventually, with time, patience and practice, we can return to a regular sleep routine, which is far healthier than continually challenging ourselves to stay awake.

But some of us try to fit sleep into an already irregular routine.

Night shift work or rotations that include night shifts interrupt the sleep routine for 20 percent of the American

The sleep lab allows researchers to study body changes during sleep.

work force, says Charmane I. Eastman, Ph.D., associate professor of psychology and social sciences and director of the Biological Rhythms Research Laboratory at Rush.

The study of circadian rhythms—the inner cycles, such as body temperature, controlled by our biological clock—has revealed important information about when we can best sleep. When body temperature is high, we become alert and tend to perform better. When body temperature falls—as it does at night—we are more inclined to sleep.

In addition, alertness drops slightly in the early afternoon, naturally causing us to feel sleepy. In Latin American countries, rather than fight the urge to sleep, people surrender to it with a daily siesta or afternoon nap.

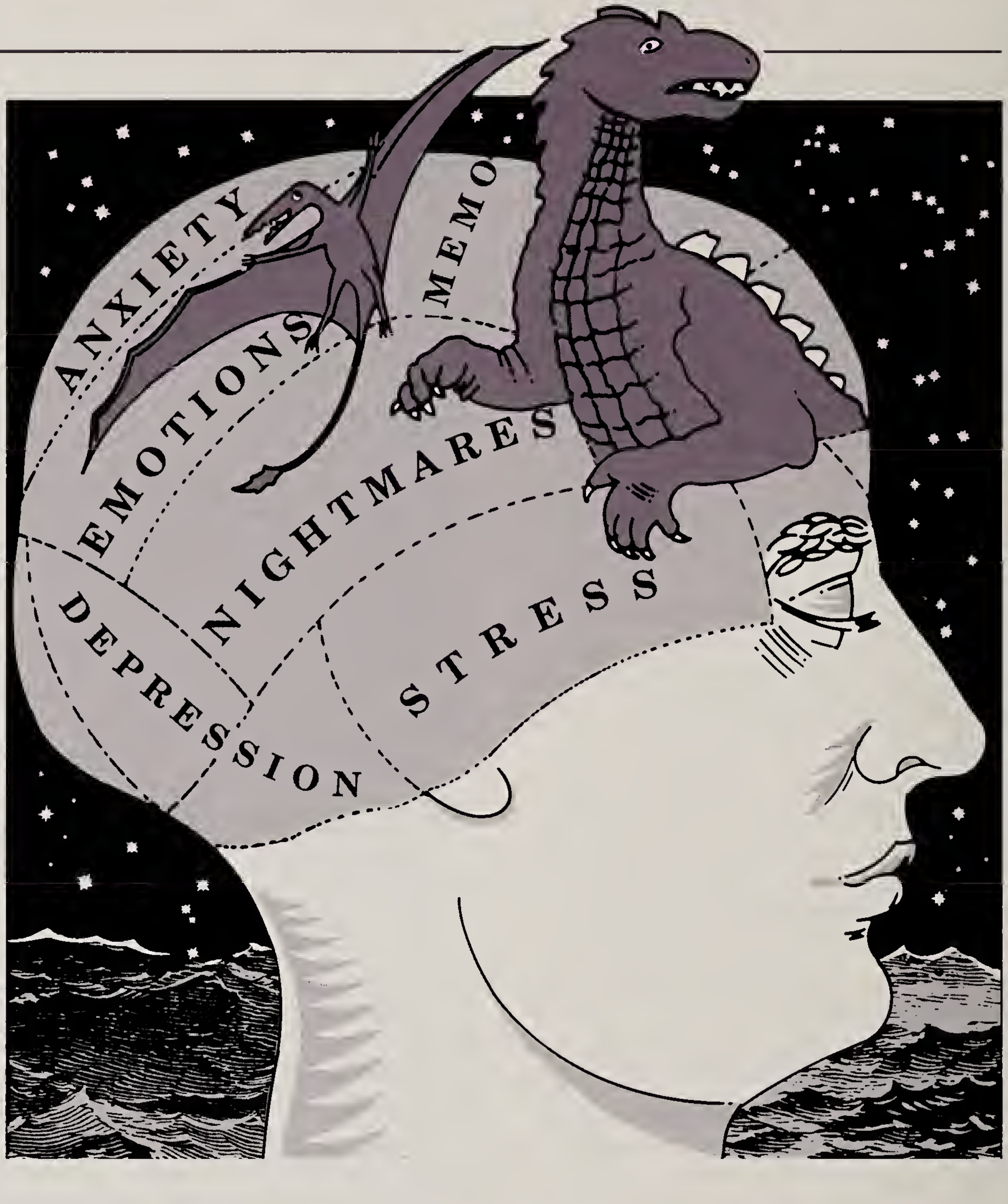
Synchronizing our natural rhythms with daytime and nighttime allows sleep to fall at its proper time. Dr. Eastman has used bright fluorescent lights to imitate the sun and change the biological clock—and thus the timing—of circadian rhythms to help people go to sleep and wake up against the natural day. These techniques may one day be used to help shift workers.

Sleep disturbances caused by jet lag are easier for the body to adjust to.

"With shift work, the time of day and night stay the same and the circadian rhythms never fully adjust, which doesn't help the worker," says Dr. Eastman. "With jet lag, we go some place and *all* the elements have changed—daytime and nighttime, the social cues, like what time dinner is, and the timing of activity—so eventually we adapt."

Although we expect sleep to come at the end of our day, we cannot order the sandman to take us to dreamland at the moment we wish. Sleep is a natural process that we can tamper with but not fully control. And the consequences of disturbing this mysterious process can affect our health and well-being.

"People are not machines," says Dr. Eastman. "We can't just be turned on and off. We're supposed to sleep at night."—*S.J.*



The Stuff That Dreams Are Made on…

Jane, 33, had the same terrifying dream for months after her divorce from an abusive, alcoholic husband.

"I'm in bed, asleep, when I hear the sound of breaking glass. It's my ex-husband, forcing open my window. He jumps onto my bed and pins me down, intending to rape me. I can feel his breath on my face.

"Using all my strength, I kick him off the bed. Then, I grab the phone and dial 911. But the police put me on hold—they actually turn on Muzak. Panicked, I run from the house, through the snow, to my neighbor's house, where I start banging on the door and yelling.

"That's when I wake up screaming, soaked with sweat. And then I feel lousy all the next day."

Vivid and intense, nightmares scare us awake, and leave us anxious and exhausted.

But what causes these nighttime monsters to emerge? Was it that last slice of pepperoni pizza before bedtime? Or are they instead a form of emotional indigestion, triggered by troubling issues in our waking lives?

Many experts are convinced that the way we dream is closely tied to the way we feel. When we're content and feel good about ourselves, our dreams are relatively carefree. But dreams also reflect our darker moods.

Depression, in particular, plays havoc with sleep. Depressed people typically toss and turn with insomnia or sleep abnormally long periods—up to 15 hours at a time. Depression also triggers miserable, anxiety-ridden dreams, in which people tend to cast themselves as victims of circumstances they can't control. Doors won't open and they're trapped…they show up for tests for which they haven't studied… they're verbally or physically attacked and they can't fight back. Their dreams carry themes of pessimism, passivity and hopelessness.

> ***"Dreams help us work through issues that are too emotionally charged and painful for us to confront when we're awake."***

It's been suggested that the best way to treat depression is to stop these horrible dreams. In fact, one thing antidepressants do is inhibit the dream cycle. But research conducted by Rosalind D. Cartwright, Ph.D., shows that dreaming—even when dreams are bad—can be therapeutic.

Dr. Cartwright is chairperson of the Department of Psychology and Social Sciences and director of the Sleep Disorder Service and Research Center at Rush. She's also one of the world's foremost authorities on sleep and dreams. In her new book, *Crisis Dreaming: Using Your Dreams to Solve Your Problems* (Harper Collins), Dr. Cartwright explains her theory—now widely held—that dreams reflect an inner emotional state.

Much of *Crisis Dreaming* is based on Dr. Cartwright's own research. Intrigued by the relationship between our dreams and the way we cope, she recently studied 200 men and women going through divorce.

Divorce brings turmoil and change, and often triggers depression.

"It can leave a person with deep feelings of loss and personal failure," says Dr. Cartwright. "It's a time of crisis and, at such times, our dreams go into high gear."

Seventy of these divorced men and women spent three consecutive nights in the Rush sleep laboratory, where Dr. Cartwright and her staff tracked their sleep patterns and "captured" their dreams. After periods of dreaming sleep, or REM sleep, the sleepers were awakened and asked to describe their dreams while the images were fresh in their memories.

Psychological tests had shown that about half—47 percent of the men and 51 percent of the women—were clinically depressed. And their dreaming patterns reflected their distress.

Normally, we don't enter the excited brain state of REM sleep until we've had about an hour and a half of deep, restful sleep. Our first REM period lasts about 10 minutes and then we return to deep sleep. We repeat this cycle three or four times during the night, with each successive REM period a little longer than the last.

REM and Depression

By contrast, the depressed subjects had erratic REM sleep patterns. Most entered REM less than 60 minutes into sleep and their first period of REM tended to be the longest of the night.

Throughout the night, their dreams were long, unpleasant and filled with strong emotions. For many, the chief source of their stress—the former spouse—was a recurring theme. Yet, tests of these people a year later showed that those who had these intense dreams recovered completely from their depression. Those who, by comparison, had milder dreams were still depressed.

"Dreams help us work through issues that are too emotionally charged and painful for us to confront when we're awake," explains Dr. Cartwright. "How people dream may make a real difference in how quickly and how well they repair their self-image and accommodate to their changed circumstances."

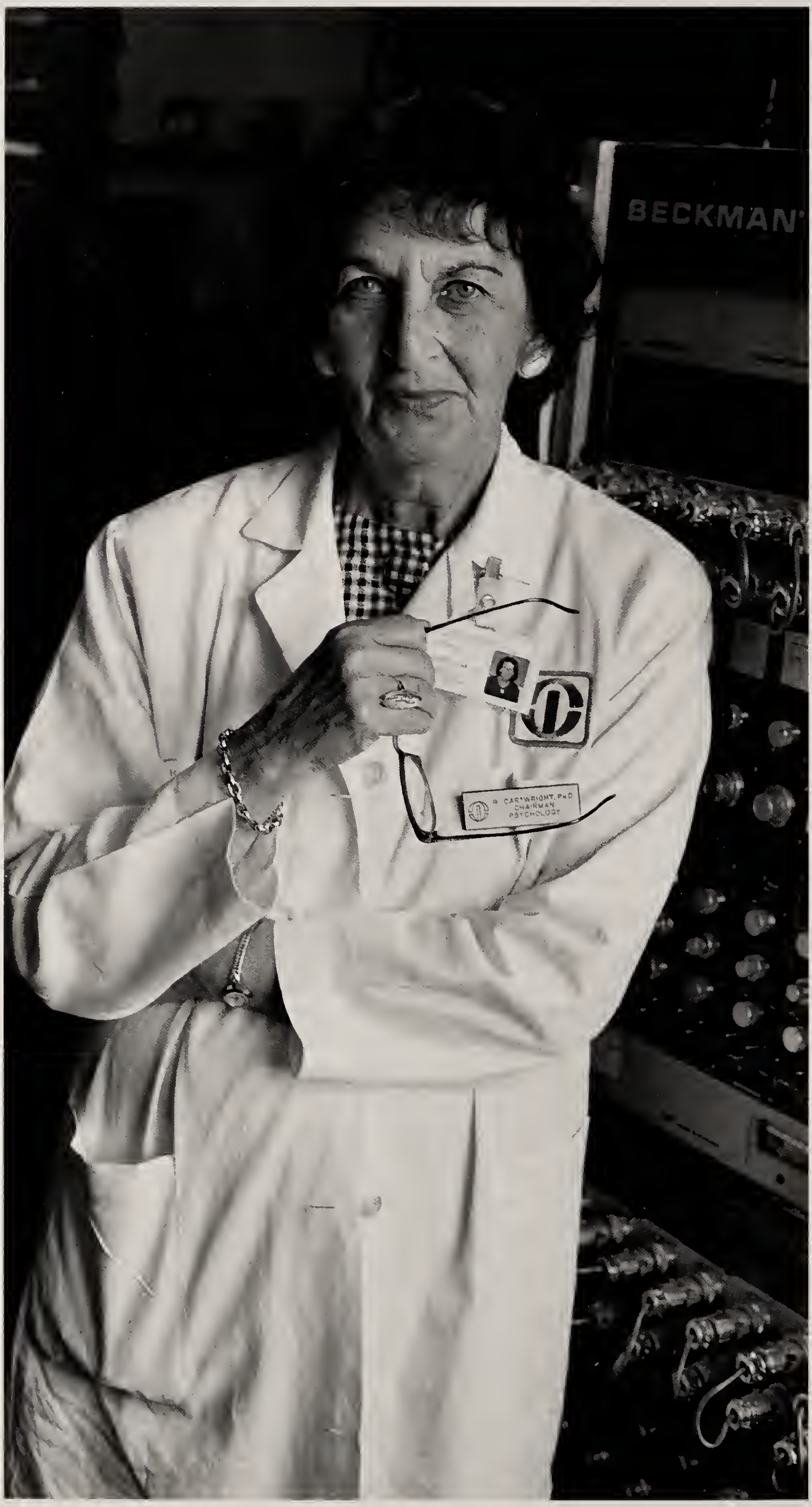
Experts suspect that dreaming has other important jobs as well.

Sleep and dreams are explored with a high-tech device called a polysomnograph. Through sensitive electrodes taped to the skin, researchers can measure a sleeper's brain waves, breathing and heart rate, muscle tone, and eye and limb movement. Changes such as increased eye movement and relaxed muscle tone indicate that someone has entered REM sleep and started to dream.

Among adults, about 25 percent of an average night's sleep is REM sleep. Fetuses and newborn babies spend more than half of their slumber in REM, suggesting that it plays a role in their cognitive development. But infants don't dream—at least not in the way we usually define it—until they can process impressions of the world and store them in memory, an ability most develop by the time they are six months old.

Sleep lab research shows that almost all mammals dream. One theory is that, during REM sleep, animals process and store memories that help them survive. The family cat, for example, may dream about a recent unfriendly encounter with a dog to reinforce a valuable new lesson—the importance of fleeing whenever a dog approaches.

In humans, too, researchers theorize that REM sleep and dreams play a role in the consolidation of new memories. Dreaming increases when we're involved in new learning—a foreign



Rosalind Cartwright, Ph.D., chairperson, Psychology and Social Sciences

language-immersion class, for example. But researchers, including Dr. Cartwright, suspect that dreaming has other, more complex functions.

Even though we've been dreaming since prehistoric times, the nature of dreams has been elusive. The ancient Greeks thought dreams were messages from the gods. Eighteenth century philosophers took a more practical view, saying dreams came from sleeping in a position that constricted blood circulation—the mind's way of telling the body to roll over. It wasn't until 1900 that Sigmund Freud proposed the intriguing theory that dreams were "the royal road" to the unconscious.

Today, there's still dispute about what dreams are and what they do. Some scientists think that dream images are, in and of themselves, meaningless neurochemical gibberish—random bursts from nerve cells in the brainstem. The dreamer then imposes meaning on these images, expressing whatever is on his or her mind at the time. Other researchers suggest that dreaming is a way of purging unnecessary information from the brain.

The Necessity of Dreams

Dr. Cartwright and many others, however, reject the idea that dreams are superfluous. Dreams, says Dr. Cartwright, are necessary for survival.

"I believe that dreaming is designed, not to erase experience, but to highlight it, to help us maintain and update our internal emotional picture of ourselves," she writes in *Crisis Dreaming*.

Most of us remember our dreams sporadically—one or two a week, at best. But sleep researchers have found that the average person has about four dreams each night. Alone, a dream may seem meaningless and bizarre. But in the context of the night's other dreams—and the dreams of the night before and the night after—a storyline emerges. Images recur. We may have the same dream several times, but with different endings.

According to Dr. Cartwright, this is the process by which the unconscious mind confronts issues and problems. Dreams, she explains, allow us to integrate today's new events and concerns with our stored memories of similar images, feelings and sensations. In doing so, they help us maintain our sense of identity, especially as our life situation changes.

Loss of a job, for example, can trigger long-buried memories of anxiety and rejection.

After being laid off from work, 42-year-old Frank dreamt that he was a small child lost in a shopping mall—something that actually happened to him when he was five. According to Dr. Cartwright, while these types of dreams underscore feelings of loss and insecurity, they also serve as reminders that we have survived other crises.

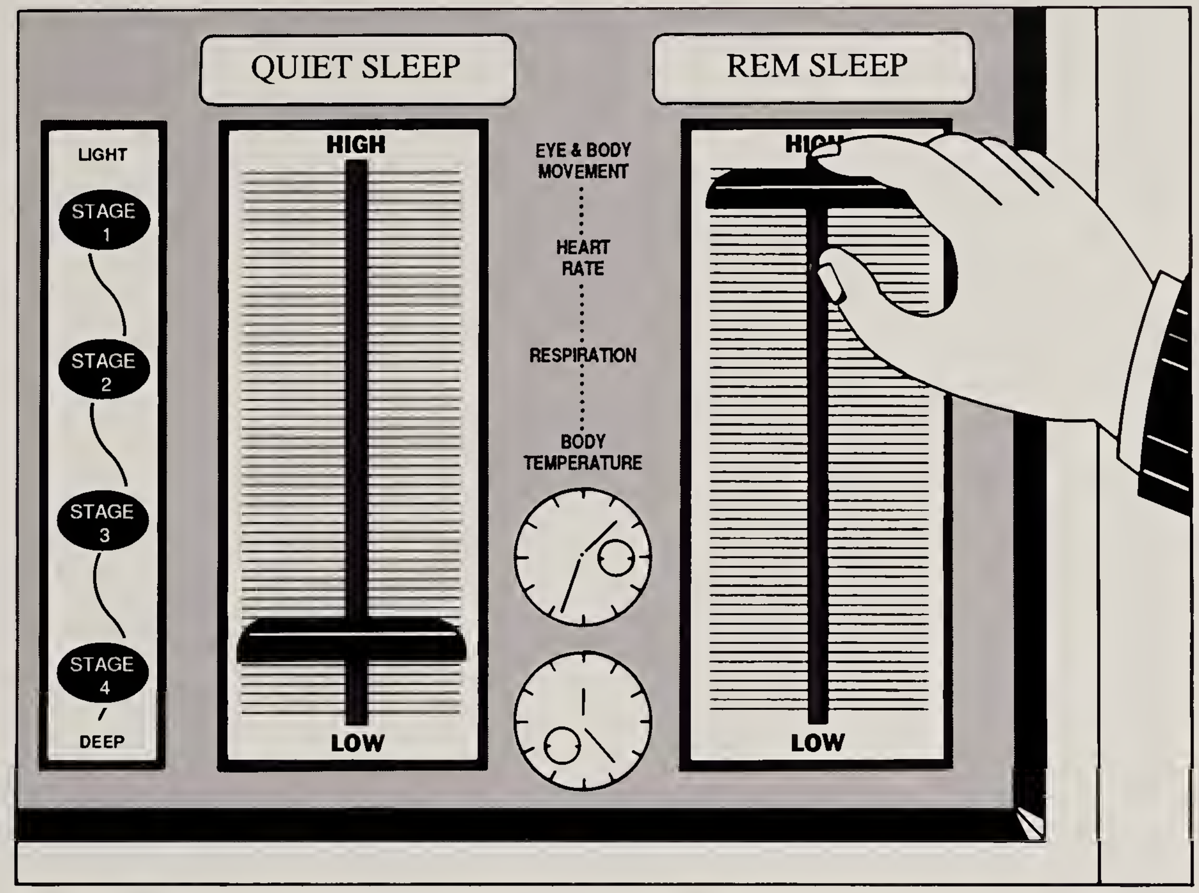
During a turbulent time like divorce, a period of unpleasant dreaming is normal, even healthy, says Dr. Cartwright. Bad dreams reflect the person's distress and, what's more, they seem to help the person cope with it. Over time, dreams usually become more positive, reflecting the person's emotional progress.

But sometimes, for reasons that aren't completely understood, this healthy process breaks down. Dreams become persistently hurtful and masochistic. Instead of helping to confront painful issues and solve problems, they perpetuate a poor self-image and inability to cope. Each morning, the person wakes up exhausted, feeling worse than the night before.

Controlling Dreams

When this occurs, Dr. Cartwright prescribes a unique therapy in which people learn to control the outcome of their own dreams. She's found that this dream therapy can be used to break the destructive dream cycles that feed depression.

"We can redirect dreaming to perform its normal, healthy function," says Dr. Cartwright. "We rewrite our own bad scripts."



During REM sleep, the body responds as if fully awake.

To fix our dreams, we have to remember them. According to Dr. Cartwright, we can program ourselves to wake up after each REM period, when dream images are still fresh in our minds.

"Often, it's enough to simply remind yourself of your intention to wake up after a dream as you drift off to sleep. This way, you set your mind to the task," she says. Setting an alarm clock to interrupt sleep at different times during the night can be a more foolproof—if more exhausting—way of catching dreams.

To change the outcome of dreams, we must first create a new ending. Then, we go back to sleep and, more often than not, back to the same dream. But now, we insert the new, more positive conclusion. Instead of silently enduring the taunts of a dream bully, for example, Jim may decide to tell him off. Mary, who has a recurring dream of being physically assaulted, can give herself the power to fight off her attacker.

"With some practice, everyone can learn to do this," says Dr. Cartwright. "You wake up and take control."

This therapy can help those who suffer from sleep terrors and violently act out their nightmares—much to the alarm of their bed partners.

"Sleep terror patients tend to be bottled-up emotionally," says Dr. Cartwright. "By day, they're meek and kind. They never get angry, never express hostile feelings. But during sleep, they let these feelings out."

Most of these patients scream and flail about in their beds. Some actually engage in bizarre, even dangerous, activities like fighting off imaginary attackers, running from their homes or jumping out of windows. "In therapy, we teach these people to dream out their aggression, not act it out," Dr. Cartwright explains.

She recalls one man, a soft-spoken Walter Mitty-type who suffered from a horrific, recurring nightmare in which a bus ran him down. He would punch and kick his wife in his efforts to flee its path.

"We discussed a new ending for his dream," says Dr. Cartwright. "I thought he might decide to grow wings and fly out of the way or something like that. Instead, this meek, mild man decided to give himself a machine gun so that he could attack the bus and its driver. I was quite surprised...but once he changed the ending, he felt better and he never had the dream again."—*C.J.*

The Other Half of Teen Pregnancy

Rush social workers help boys avoid becoming parents too soon.

by Sara Parker Floyd

On an early June day at Sumner Elementary School on Chicago's West Side, nine sixth grade boys huddle around a binder packed with trading cards of their basketball heroes. Ten and 11 years old, at the same time worldly and vulnerable, they laugh and tease each other while waiting for their tutoring session to begin.

"All you've got to do is work hard," Rush social worker Floyd Garrett reminds the boys at the start of class.

Garrett is director of the Male Responsibility Program of the Adolescent Family Center at Rush. Sumner is one of five elementary schools he visits during the school year to teach the boys not only the basics of math and reading, but the basics of how to get along in the world—particularly, how *not* to become teen fathers.

Reaching Boys Early

Each year in the United States, more than 1 million teenage girls—one-tenth of all girls between 15 and 19—become pregnant, according to the Alan Guttmacher Institute, a non-profit group that studies reproductive health issues.

Chicago has one of the highest teen pregnancy rates in the nation and it's a rate that continues to soar. From 1985 to 1990, births to teenage mothers jumped 15 percent.

But the other half of the pregnancy equation—young men—has only recently come into focus.

Rush started its Male Responsibility Program six years ago. It is one of about a dozen in the state funded by Parents Too Soon, a program sponsored by the Illinois Department of Public Health.

Floyd Garrett, director of the Male Responsibility Program of the Rush Adolescent Family Center

Parents Too Soon aims to reduce the number of teen pregnancies, improve prenatal care for young mothers and help teen parents handle responsibilities. Most recently it has gained national recognition for its efforts to reach young boys.

When the Rush program first began, it targeted 15-to-19-year-old boys and offered them one-day workshops and meetings on sexuality and family planning.

But since 1990 its focus has expanded to working with younger boys in an ongoing program.

"We decided we could be more effective in preventing teen fatherhood if we reached younger boys before they were in danger of dropping out of school," says Stephen Gillenwater, M.A., director of the Adolescent Family Center.

"And we wanted to reach them before they became sexually active."

What does dropping out of school have to do with early parenthood?

"When they drop out of school, they're usually unemployed and hanging out on street corners with nothing to do," says Garrett. "They're bored, and that has a tendency to lead them to try to find girls and have sex, without thinking about the consequences."

Once they become parents, completing their education becomes even less of a priority.

Studies show that by the time teen fathers are 20 years old, only 39 percent receive high school certification, compared with 86 percent of young men who postpone parenting.

The boys Garrett tutors are those the schools believe are the most likely to drop out. Teachers target the students with behavior problems and those who have trouble concentrating on their schoolwork.

Most of the boys come from low-income, troubled families.

"They spend the school day acting out the chaos they see at home," says Gillenwater. "It's not so much that they don't have academic potential, it's just that so much is going on, they can't concentrate on school."

Nearly one-third of the men over age 25 in the five West Side Chicago communities where Rush runs its Male Responsibility Program have dropped

> ***"The boys pretend to know a lot about sex and a big thing is trying to clear up the myths."***

out of school before the ninth grade. This section of Chicago is one of the city's poorest, rife with unemployment and crime.

National studies indicate, too, says Gillenwater, that inner-city African-American and Hispanic boys begin to fall behind girls in academic test scores as early as the fifth and sixth grades. Given this, boys are most in need of encouragement to stay in school.

The Rush program focuses on boys in the sixth through eighth grades. Garrett works with more than 50 boys a year, usually in groups of 12 to 15 for about an hour a week.

He helps them become better at math and reading and also teaches them about anatomy, puberty and contraception.

Building Self-Esteem

At the start of each school year, boys complete a self-image questionnaire that asks a series of questions including, "What do you like most about yourself?" and "What would you like to change about yourself?" Building their self-esteem is one of his main goals.

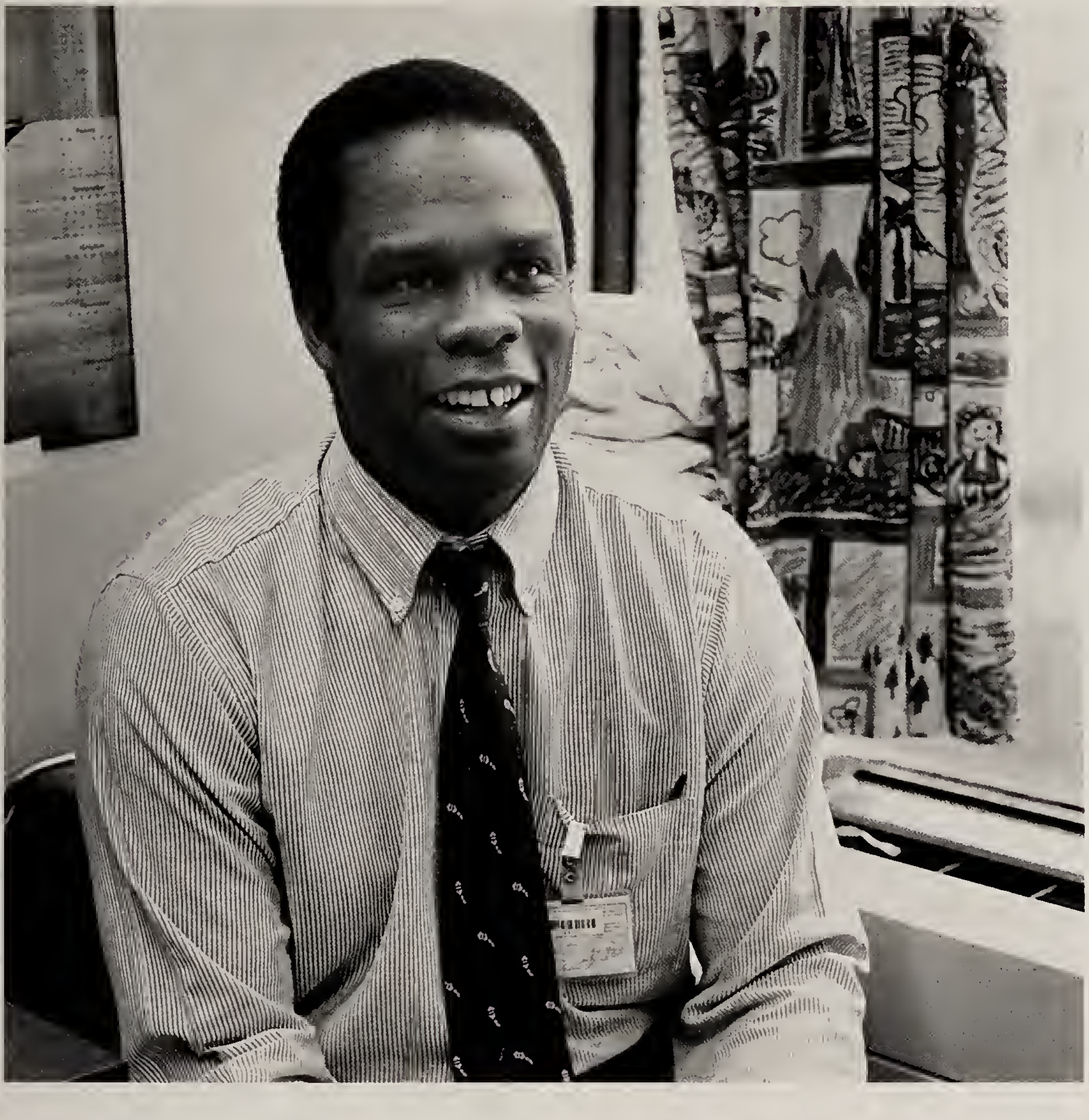
"Without self-esteem a boy is already halfway lost," Garrett says. "If he doesn't like himself, he's not going to care about anyone or anything else.

"I try to present the boys with a lot of positive male role models. We talk about African-American inventors and politicians, but a good role model can even be someone in their family or someone they meet in school."

To keep them interested in school, Garrett uses a lot of encouragement.

"I find out what they're interested in, what their favorite subjects are, and help them to focus on what they do well. It's important for them to realize their strengths and to know that they could get help in those areas they're weak in."

Back at Sumner Elementary 11-year-old Jamel eagerly volunteers to talk to a visitor about what he's learned in the sessions.



Stephen Gillenwater, M.A.

What's the best part of Garrett's visits?

With a quick smile that brims with charm, Jamel says he likes it when Garrett gives the boys basketball cards for good performance. And when they learned about "body parts," that was pretty cool, too.

"The boys pretend to know a lot about sex and a big thing is trying to clear up the myths," Garrett says.

When he first came to the schools, he found out that many of the boys believed that a girl can't get pregnant if she has intercourse standing up. And the talk around school was that you could use earwax to tell if a girl has a sexually transmitted disease.

"We want to make sure that the boys don't feel stupid if they ask questions," says Garrett, who has two sons of his own, ages 10 and 6.

"I make it a point to let the boys in the class know that no question is dumb. Then I make up a question which I know some will think is silly. They usually start laughing. It's a nervous, tense laugh, but once that's all out, they start asking questions."

Although it's still too early to tell how successful this program will be in steering these boys away from becoming young fathers, Garrett says the boys' grades are improving and they have a better understanding of sexuality, reproduction and contraception.

According to Gillenwater, "We'll need to follow the boys at the five West Side schools for a couple of years before we can be certain of the influence we've had, but we've made a commitment to be in the schools every week, every day."

Adds Garrett, "I feel if I can reach even one boy in a class, the program is a success." ⓛ

Helping Our Bodies Heal

Researchers are looking at new ways to boost a natural process.

by Dennis Connaughton

Most of us take for granted the body's ability to heal its wounds. Say you cut your finger peeling potatoes. At first the cut bleeds, then after a while the blood clots and forms a scab. Eventually the scab falls away and, miraculously it seems, the cut beneath is healed.

But for some people the healing process is not so simple. Sores that would normally take only days to heal may linger for weeks in the old and sick, and in people with diseases—such as diabetes—that restrict the vital flow of blood.

Medical researchers are looking for ways to boost the wound-healing powers of people whose ability to heal themselves is impaired. At Rush, this involves research on better wound dressings and on the use of natural chemicals that speed healing.

Much of what medical science has learned about wound healing has come during times of war—when soldiers were shot or stabbed and often left to die of their wounds. In Napoleon's time, the French surgeon Baron Larrey devised a plan to treat the wounded right away on the battlefield and then evacuate them to base hospitals in horse-drawn carriages known as flying ambulances.

Infection was a major problem. In fact, it was not until the mid-1930s and the advent of antibiotics that physicians were able to control infection effectively. World War II marked the first time that deaths from military action outnumbered deaths from infected wounds.

"Like antibiotics, the substances we're experimenting with today merely assist the body's natural ability to heal itself," says John Blackman, M.D., assistant professor of medicine at Rush.

The body's normal healing process is as complex as it is automatic, beginning the moment the body is injured in any way.

In the case of the potato-peeler cut, the body's first response is to stop the bleeding. Blood-borne cells called platelets course through the veins to reach the site of injury. At that point, they secrete a sticky substance that glues the cells together, forming a plug to seal leaky blood vessels. At the same time, the liver secretes chemicals into the blood that cause it to clot, or gel.

Threadlike fibers known as fibrin begin to form a web in the gelled blood that holds together the sides of the cut. As the platelets build up, they pull the web tighter and harden the clot on the surface of the skin. The surface clot dries to a scab that protects the area.

After the scab forms, a cleaning process called phagocytosis begins. Certain white blood cells attack any bacteria, dirt particles or dead cells in the wound. These attack cells "eat" their prey—they engulf them, then destroy them.

Eater cells get their work done within 6 to 12 hours after injury. At this point, lymphocytes—a more sophisticated type of white blood cell—move in to attack harmful microbes. The slaughtered microbes, dead tissue, spent white blood cells and cell excretions all form pus, a sure sign of infection and the body's reaction to it.

Within 24 hours after injury, the cells in the injured skin and blood vessels begin to reattach themselves. Small blood vessels send out tendrils that spread through gelled blood and reestablish blood flow. Meanwhile, surface skin cells grow together to close the outside of the wound.

Below the surface, builder cells called fibroblasts move along capillaries and fibrin strands to bridge the wound. As they move, the fibroblasts release a chemical that combines with other chemicals in the wound to create col-

Ambulance wagons removing the wounded from a battlefield during the Crimean War.

lagen, the basic structural material of skin, cartilage, ligaments and tendons. Collagen closes the wound and completes tissue repair.

The healing process often breaks down in people with diabetes. Blood circulation may be poor, resulting in less efficient transport of blood nutrients and oxygen to the site of injury. Nerve damage can deaden feeling, especially in the extremities.

Experts estimate that, as a result, about one-quarter of the country's 14 million diabetics suffer from recurring sores in the feet and legs. Because the sores are painless, a diabetic may not seek medical care for a sore on a foot, for instance, until it is severely infected. Infection can progress to the point where amputation is necessary.

> ***World War II marked the first time that deaths from military action outnumbered deaths from infected wounds.***

Says Rush podiatrist Dean Stern, D.P.M., "The impetus for research is the need to find better ways to treat such wounds."

Experience has taught medical science that one way to speed wound healing is to prevent the formation of a scab. Though they serve an important protective role for wounds, scabs are actually impediments to the rapid growth of new skin. To prevent a scab from forming, physicians use a dressing to cover the wound and keep it moist, allowing skin cells to grow together in the healing process.

At Rush, Dr. Blackman is studying the advantages of using a new dressing called PolyMem to heal foot ulcers in diabetic patients. He's working with Theodore Mazzone, M.D., director of the Section of Endocrinology and Metabolism, and other colleagues at Rush.

About one-eighth of an inch thick, PolyMem looks like a giant adhesive bandage. The thin, absorbent pad contains a wetting agent to keep it moist, according to its manufacturer, the Ferris Manufacturing Co.

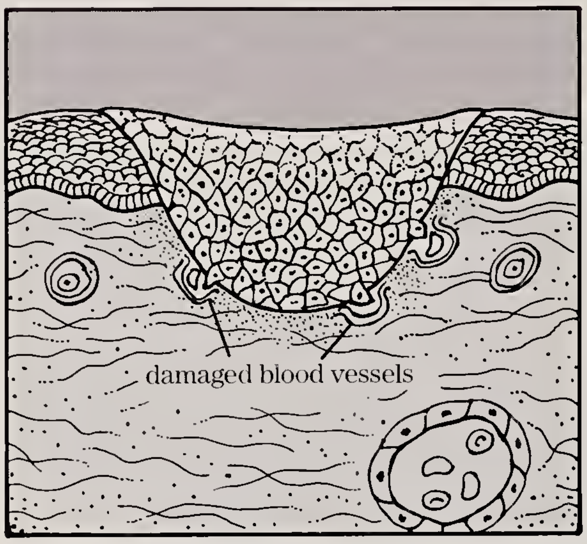
In a previous study, PolyMem was shown to be effective in healing pressure sores by drawing fluid out of the open wound and into the dressing.

The Rush study is comparing PolyMem to more traditional dressings, such as gauze used in combination with a common antiseptic.

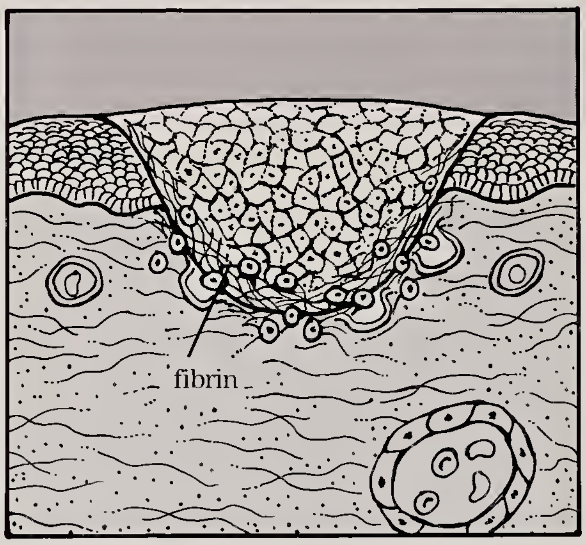
"The antiseptic makes the area germ-free, but it also destroys normal tissue and can dry the skin," says Dr. Blackman. "PolyMem can hold fluid from the wound better than other dressings, certainly better than gauze."

Dr. Stern's research also concerns the treatment of diabetic foot ulcers. But instead of a dressing, he uses naturally occurring chemicals known as growth factors to aid healing.

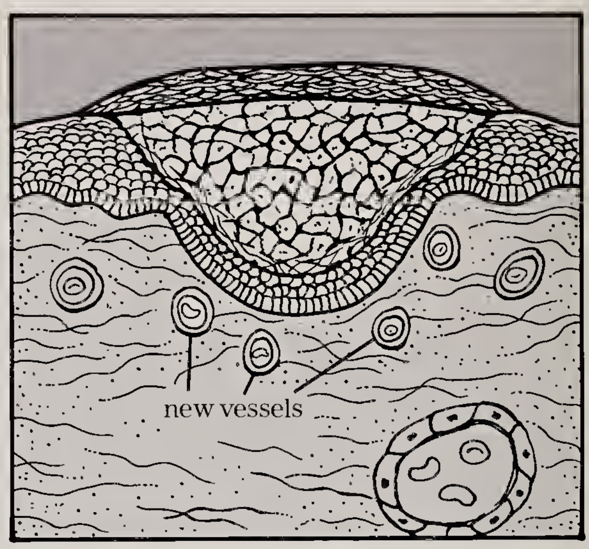
Growth factors attach themselves to the surface of targeted cells, and help them to grow and reproduce properly.



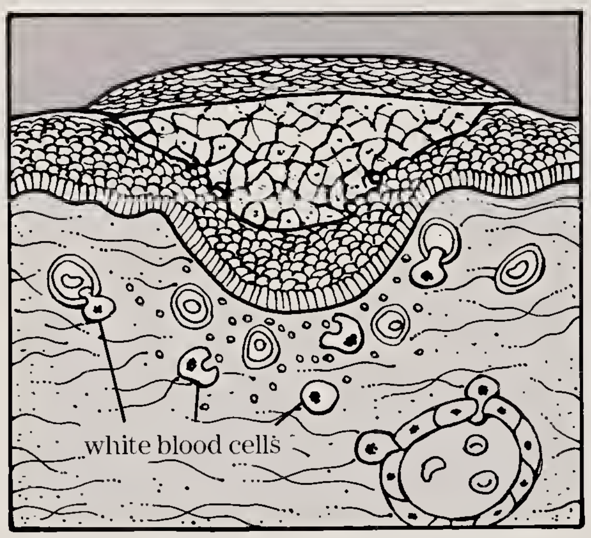
Blood-borne cells called platelets, circulating at the injury site, "glue" together to plug leaky blood vessels. Blood begins to clot.



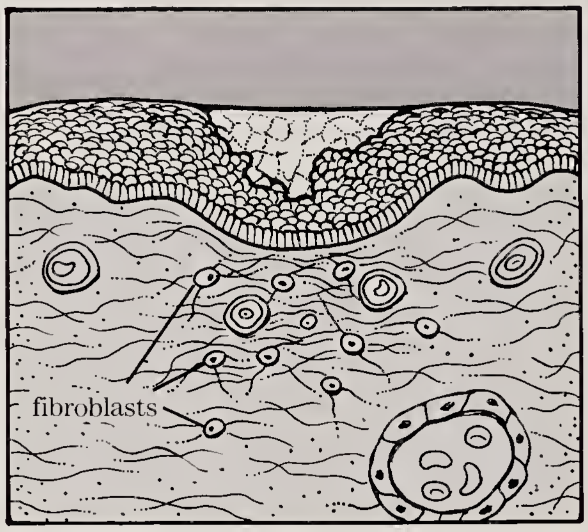
Threadlike fibers known as fibrin, formed from substances in the blood, create a web to hold together the sides of the cut.



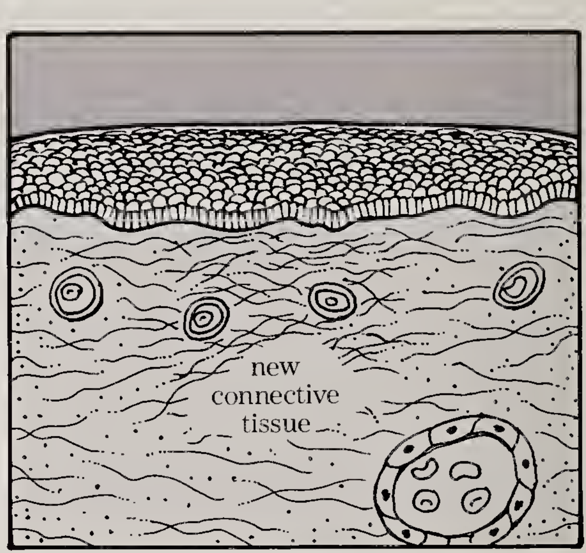
Surface skin walls off clot, new blood vessels form. Scab forms.



Special white blood cells clean the wound by attacking bacteria, dirt particles and dead cells. Surface skin resorbs clot.



Surface skin continues to resorb clot. Fibroblasts produce collagen to fill in tissue lost from clot.



Surface skin completes healing.

They play an important role in wound healing. Dr. Stern is looking at a particular growth factor, called fibroblastic growth factor, to find out if it stimulates the growth of fibrous tissue and skin cells in wounds.

Dr. Stern uses fibroblastic growth factor either from the patient's own blood and tissue, or produced by certain bacteria in the laboratory.

He swabs or sprays a liquid solution of the hormone directly onto open wounds after dead tissue has been cut away. Patients are then taught how to care for their wounds and given information about proper diet and footwear.

Dr. Stern and his colleagues have also had success using fibroblastic growth factor for chronic leg ulcers from varicose veins.

"Our results are preliminary, but wounds seem to be healing better," says Dr. Stern. "We don't know yet if the results are due to patients intensifying their own care or if the results are directly related to the growth factor."

Dr. Stern's co-researcher for this trial is Thomas J. Schnitzer, M.D., medical director of the Johnston R. Bowman Health Center for the Elderly, and director of the sections of geriatric medicine and rheumatology at Rush.

Dr. Schnitzer, who is the Willard L. Wood, M.D., Ph.D., Professor of Rheumatology, is also studying the effects of another growth factor, called platelet-derived growth factor, on pressure ulcers.

Pressure ulcers, also known as bedsores, occur when a person's skin presses against bony parts of the body like the hips. They're most often seen in elderly people who are confined to bed. If untreated, these painful sores can penetrate below the skin to muscles, even bone, and sometimes require surgery to treat.

Animal studies have shown that platelet-derived growth factor—which is stored in blood platelet cells and released at wound sites during clotting—speeds up normal tissue repair and reverses the effects of impaired wound healing. Research is being conducted at Rush and a number of other hospitals to measure its effect on humans.

"The study of growth factors is a logical area of research," says Dr. Schnitzer. "All growth factors are known to have an effect on getting the cells in the connective tissue and the area below the skin to grow and make tissue repair possible."

Making Strides by Saving Steps

Delivering compassionate care in the information age.

by Justine Hewerdine

With the subtle aid of twenty-first century technology, nurses are spending more time listening, holding a hand and paying attention to patients' needs.

It is quite possible, however, that patients won't notice the innovations—the tiny lapel microphones, the belt-packs that act like walkie-talkies and the mini computers mounted next to their beds.

But that's the point. What nurses want patients to notice is that their requests are answered quickly and their medications delivered in minutes. Patients can more easily talk to their nurses because nurses are spending less time writing in charts and more time in patient rooms.

"We're serving more educated consumers who have higher demands and expectations of their health care providers," says Cathy Catrambone, M.S., R.N., of Nursing Services Research and Support at Rush.

"We have to spend more time answering their questions. Sometimes they tell us how they feel by their facial expressions, their gestures, the way they say something—or don't say it," says Catrambone. "But without sitting down and taking the time to notice these things, we wouldn't know."

Time has been a battle for staff nurses all over the country. Not only are they responsible for day-to-day patient care and reporting on patients' progress, many also balance these duties with managerial tasks.

At Rush, nurses had typically spent 90 minutes a day recording treatments in patient charts. They walked more than five miles, responding to patient call lights and overhead pages that numbered as many as 465 a day on any given unit. As these demands continued to interrupt patient care, finding ways to save time became critical.

Thanks to new technology, Rush nurses spend less time doing paperwork and more time delivering patient care.

As one way of increasing efficiency, Rush introduced bedside computers to some of the patient care units this past April.

The computers instantly record vital signs—body temperature, respiration, heartbeat and blood pressure—as nurses measure them. The computer also makes time-consuming, handwritten notes unnecessary.

"The computer allows nurses to automatically record their observations," says Catrambone, who helped coordinate the installation of the system at Rush. A binder at the bedside includes 56 pages of barcodes representing typical symptoms and standards of care that can be read by a wand attached to the computer. At the push of a button, the scanned information appears on the screen, giving a quick update to those responsible for the patient's care.

Throughout the shift, nurses can enter a command on the bedside terminal and send all information on a particular patient to a computer at the nurses station. Printouts of the patient-care record are reviewed for accuracy.

When bedside computers emerged in the health care industry in 1986, they were bulky, office-style terminals with separate keyboards. Many required a desk that could not fit next to patient beds—and nurses had to turn their backs on patients to use them.

"When we were choosing our system, we listed several priorities," says Catrambone. "It had to be easy to learn, able to measure and record vital signs and be as small and unobtrusive as possible. It also had to be easily networked into Rush's mainframe computer. Our main objective was to document our patient care at the point where the care is delivered—at the bedside."

Rush Leads the Way

Fewer than 100 of the more than 6,500 hospitals across the country are using bedside computers—though the numbers have been increasing every year. Rush is one of 25 hospitals using the small, wall-mounted system—the only one that can instantly record vital signs. With only 10 buttons to push beneath its small rectangular screen, it is simple to use.

With a touch of a button, a nurse can review a patient's vital signs.

Rush was the first in the country to establish a link between the bedside system and another hospital computer network which records patient admission data—full name, medical record number and name of the attending physician. Now this information automatically appears on the bedside computer system where it needs to accompany the treatments recorded.

While bedside computers brought patients and nurses closer together, nurses were still trying to somehow bridge the distance between themselves, so they wouldn't have to leave the bedside to answer their overhead pages.

Two small appliances made the difference. Lapel microphones and intercom-like boxes, known as belt-packs, are now part of their uniforms.

The equipment resembles the gear worn by fast-food workers, with one major difference in purpose. Fast-food employees use the technology to minimize the time needed to serve a customer. Nurses are using the quiet, wireless communication system to increase their time with patients.

"Nurses can now be silently paged at the patient's bedside, without robbing that person of a quiet hospital atmosphere," says Kathy Pischke-Winn, R.N., of Nursing Services Research and Support.

"The main console at the nurses station allows unit clerks to speak directly to a particular nurse, or to address the entire unit staff through each belt-pack. And nurses do not have to leave the bedside to answer a page.

"Rush is the first institution in the Midwest to pilot this silent two-way communication technology," says Pischke-Winn, who helped coordinate the installation of the system.

Seeing positive results, nurses concentrated on how to better use the communication system. Today, all employees on the unit use the new system. For example, nurses rely on unit assistants to carry out requests such as delivering water to patients or making a bed. But the process had resembled a relay race—with the nurse trying to keep the task in mind while searching for a unit assistant, either on

A binder at the patient's bedside contains barcodes representing typical symptoms and standards of care.

foot or by page and, upon finding the assistant, passing on the information. Some requests might be delayed or go unanswered because the nurse got called away by another patient.

"Now the unit assistants are also equipped with belt packs, so nurses no longer have to disrupt their own work to look for them. They can just pass the request on through the system," says Pischke-Winn.

"I remember being in the hospital several years ago, and having a hard time falling asleep because it was so noisy on my floor," says Karen Kelleher, a patient on one of the units where the technology is being piloted. "But now I've noticed that it's very quiet here, especially at night. I don't have any problems falling asleep."

"The nurses report that they are actually walking less and that the system has brought them closer to patients, but we want to make sure," says Pischke-Winn. She and her colleagues will conduct pedometer studies and other tests to measure the system's success.

> ***"Nurses can now be silently paged at the patient's bedside, without robbing that person of a quiet hospital atmosphere."***

Research on the bedside computers has already shown positive results. A 1991 poll of 283 health care professionals at nine hospitals with bedside computers showed that nearly 90 percent agreed that the benefits they expected from the system—reduced paperwork, less time spent filling out charts, improved documentation and availability of patient information—were realized.

"We'll be conducting studies to see how much time nurses really are saving because of the computers," says Catrambone.

"We hope to see nurses spending more time talking to patients about how they feel—whether they're in pain, or if we can make them more comfortable. We want patients to have more of a say in their care."

Finding Help and Hope

by Carmeline Esposito

"I was like a
I co
engulfed in

ounded child. I didn't want to talk. I wanted to hide.
dn't communicate with another human being. I was
stinking vapor that clogged my brain and my mind."

—Rod Steiger talks about his continuing battle with depression…

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> ***"Depression has to do with everything. When you're depressed, you feel like you've got a thousand pounds on every limb of your body."***

Rod Steiger, Academy Award-winning Best Actor and three-time Oscar nominee, was in Chicago in May for the grand opening of the new Rush Institute for Mental Well-Being.

Steiger is one of an estimated six million Americans who suffer from major depression each year.

A Treatable Illness

"The fact is, depression is a medical illness," says Jan Fawcett, M.D., the Stanley G. Harris, Sr., Professor and chairman of psychiatry and the Grainger Director of the Rush Institute for Mental Well-Being.

"It ranks second only to severe symptomatic heart disease, when considering time lost from work and business. The other important point to remember is that depression is a very treatable illness. But only a third of all those with severe depression will get treatment."

Undiagnosed depression takes an annual toll of approximately $29 billion in medical expenses and days lost from work, according to the most recent figures available from the National Institute of Mental Health.

Steiger, who won an Oscar for his performance in "In the Heat of the Night," says that during the 10 years before he sought help, he was sometimes so depressed that he had to stop working.

"I got frightened. My agents got worried. So I did three awful pictures. When I had moments of clarity, when my depression went away, I knew that those three pictures were terrible. But I had to support my family.

"Depression has to do with everything. When you're depressed, you feel like you've got a thousand pounds on every limb of your body. Mostly, for me, it's a terror because it knocks the bejesus out of your feeling of confidence. As an actor, all of a sudden I believed that I wouldn't be able to remember lines."

Steiger says his depression began in the few weeks following his triple heart-bypass surgery in 1976.

Facing the operation, he recalls feeling separate, or detached, from it.

"This was not happening to me," he remembers thinking. "I'm not like other people who die."

Dr. Fawcett explains that it is not uncommon for people facing a stressful event like heart surgery to suffer a temporary depressive reaction, but after two to four months they usually rebound. Some people, however, are more vulnerable to serious depression.

"Whether or not someone gets seriously depressed after a physical and psychological stress such as major surgery depends on the emotional state before the surgery," Dr. Fawcett says. "The depression may have been there

About The Rush Institute for Mental Well-Being

The new Rush Institute for Mental Well-Being provides a comprehensive program of evaluation and treatment for people with depression and related illnesses.

"We want to take the best of technology and apply it to the treatment of depression and all its related disorders—alcoholism, anxiety disorders, schizophrenia," says Jan Fawcett, M.D., the Stanley G. Harris, Sr., Professor and chairman of psychiatry and the Grainger Director of the Institute.

For its commitment to research, the Rush Institute has been recognized nationally.

Says Frederick Goodwin, M.D., director of the National Institute of Mental Health, "You get your best ideas from listening to your patients. And if you get too far away from the patients, forget about doing innovative research. While we're learning new knowledge, we have to treat people and apply that knowledge. That's what this Rush Institute is all about."

Through the Institute, a vast array of treatment and research programs are coordinated to provide a continuum of care—inpatient and outpatient treatment, as well as rehabilitation.

The treatment team includes psychiatrists, psychologists, social workers, nurses and other specialists who work together to tailor individualized plans of care.

Services include a day hospital that allows patients to live at home while receiving daily treatment, a transitional residence for patients discharged from the hospital, a chemical dependency program, child and adolescent psychiatry, a day school for emotionally disturbed children, and geriatric psychiatry.

Research at the Institute focuses on depression, panic disorder, obsessive-compulsive disorder, anxiety disorder, alcoholism, adolescent suicide and winter depression.

The cornerstone of the Institute is the Woman's Board Depression Treatment & Research Center.

"The Woman's Board made its commitment to depression because it touches so many and because it has been among the least funded areas in medicine," says Joan Weinberg, president of the board.

The Rush Institute for Mental Well-Being, which opened in May, was the first of six multidisciplinary centers planned at the Medical Center. The Rush Heart Institute held its opening this past September. Institutes will also be established for aging, arthritis and orthopedics, cancer, and neurological disorders.—*P.R.*

Oscar winner Rod Steiger (left), shown here with Institute director Jan Fawcett, M.D., has spoken publicly about the need for education about depression.

already. Life-threatening surgery could trigger it and send someone on a downhill course."

After his surgery, Steiger gradually lost interest in things.

"You start to withdraw and isolate. You don't communicate with anyone unless it's necessary. You don't shave, you don't dress. It's like a mist rolling in. You're engulfed in it. Then, all of a sudden, you're imprisoned in it."

For four years depression made Steiger a prisoner in his own home.

"My wife had this robe-covered, stinking bum who said, 'Good morning' and then nothing for 12 hours until 'Good night.'"

Steiger meticulously plotted his own death at least three times. In a cold, flat voice, he describes his death scenario. The setting is the Pacific ocean, at his beachside home.

"I'll get a small rowboat and row out on the ocean. I'll have a gun. And I put it in my mouth and I pull the trigger and the boat floats away. My body floats away from it. No mess. Just fish food."

Steiger credits his wife, Paula, with saving him from killing himself. "If not for my wife's love and patience, I'd be an old headline today," he says.

Research has shown that 60 to 70 percent of seriously depressed people have suicidal thoughts and as many as 4 out of every 10 show some kind of self-destructive behavior.

About 15 percent of people with major depression kill themselves. More than half of these people see a primary care physician in the month preceding their death. They may complain about fatigue, chronic pain or loss of appetite, which are symptoms of depression that can be mistaken for signs of other illnesses.

"One of our goals at the Institute is to educate primary care physicians about the symptoms of serious depression and the treatments available," says Dr. Fawcett.

"We can show them how to perform an evaluation which considers depression as part of their medical differential diagnosis, to pick up on suicidal thoughts, and to address the problem before it's too late."

The Search for Treatment

For four years Steiger searched diligently for the right physician and treatment. He interviewed numerous doctors.

"It was like looking for the best director for a play," he says. "I was looking for someone who understood depression as a sickness, a doctor who had a sense of humor, who was sensitive."

Doctors diagnosed him as depressed, he says, but medications they prescribed did not help and he continued to feel depressed. Finally, he found a psychiatrist near his home who understood the particular biochemical nature of his depression. This physician worked with him to find the right medication to help him recover.

"Without the medicines, I wouldn't be here," Steiger says.

"Standard medical treatment for major depression is antidepressant medication, given skillfully in the context of a psychotherapeutic relationship," Dr. Fawcett says.

> ***"After 67 years of life, there are two things I've learned—courage and keep moving."***

"But depression is a very heterogeneous illness," he adds. "Different people respond differently to various antidepressants. We are making progress in learning how each of these medications affects brain chemistry."

Some antidepressants have more side effects than others, including dizziness, dry mouth and weight gain.

At least 15 antidepressant medications are now available for treatment and, Dr. Fawcett says, there are about 30 more in development.

How do antidepressants work?

More than 30 years ago, neuroscientists identified certain chemical substances in the brain that are responsible for mood. These substances, or neurotransmitters, are serotonin, dopamine and norepinephrine.

Antidepressants modify the levels of these neurotransmitters. The newer antidepressants zero in on low levels of certain neurotransmitters.

Dr. Fawcett says that many people can stop taking an antidepressant within 6 to 12 months without suffering a relapse.

"There are others, however, who experience another episode of depression at some point in their lives and who will then require sustained maintenance treatment," Dr. Fawcett says.

"We are running six different drug studies on depression, including one on why 20 to 30 percent of people who are depressed do not recover with standard medications."

Help at Last

Steiger's personal quest for treatment highlights the need for improved education and knowledge about major depression as a bona fide medical illness.

"There is pain," Steiger says, "but pain is part of being human. These are human problems. I am tired of people with human problems being victims."

Steiger says that he sees his psychiatrist once a month or every other month for a check on his medication. In this way, his physician can determine improvement gain and check for any side effects of the medication.

And today Steiger is an outspoken advocate for more education about depression.

"The more I understood about it and myself, the more I tried to do something about it. Not to kill myself. To realize that there is help and hope. It was like a chain reaction—the more I knew, the stronger I got."

Steiger has appeared on television and in public mental health meetings where he has shared the podium with Frederick Goodwin, M.D., director of the National Institute of Mental Health. Dr. Goodwin was also in Chicago for the opening of the Rush Institute for Mental Well-Being.

"I think that people are starting to accept the fact that depression is a medical illness. What started that was the development of drugs. Once there were medications that could help them, people had to accept the fact that there must be some kind of biological, chemical part to it," Dr. Goodwin says.

"Research destigmatizes by providing solid, credible knowledge, by replacing fear with hope, by replacing confusion with specific treatments.

"But, at least as important as that, is having some people the public knows and admires step forward with their own experiences," he says. "That requires a good deal of courage and persistence. One of the things that I admire most about Mr. Steiger is he stuck to it."

Steiger's battle with depression and his journey to find an appropriate, effective treatment has given him a new philosophy of life and living.

"After 67 years of life, there are two things I've learned—courage and keep moving," Steiger says.

"Courage is just getting out of bed every morning, and starting a new day. It's not giving in to the fears and doubts that are part of the terror of depression. Not isolating. That's the illness. And, keep moving—one minute at a time."

Editor's note: Since his visit to Rush, Steiger has added two important footnotes to his story. In June, the actor, who never graduated from high school, was awarded an honorary doctorate from Chicago Medical School, in recognition of his efforts as a mental health advocate. At about the same time, he and his wife, Paula, announced that they expect their first child early next year.

Team Physician to the World's Greatest Orchestra

Rush doctor travels with the Chicago Symphony.

by Ellen M. Hunt

The Chicago White Sox have six. The World Champion Chicago Bulls only have one. And what many have called the World's Greatest Orchestra boasts two.

In the language of sports they would be called team physicians, an apt name for the doctors who travel with the some 140 members of the Chicago Symphony Orchestra when they go on tour.

Rush internist C. Anderson Hedberg, M.D., has traveled with the orchestra since 1978. His most recent trip was in June when he accompanied them to Salzburg, Austria.

From the orchestra's point of view it's both practical and reassuring to have a physician travel with the group when they tour.

"You have a group of more than 100 people, plus families, going into strange cities," says Henry Fogel, executive director of the Chicago Symphony Orchestra. "You have language problems and musicians under the pressure of having to perform and be in good shape. You can't have them worrying, 'If something happens to me, where do I go? Do I have to ask a strange hotel clerk where to find a doctor?' We all feel more comfortable with a doctor along."

Dr. Hedberg, who is a senior attending physician and president of the medical staff at Rush, began serving as the orchestra's physician through happy chance. In Philadelphia for a meeting of the American College of Physicians in the spring of 1978, Dr. Hedberg ran into a colleague at a street corner, and they started chatting.

"I knew he had been traveling with the orchestra as their physician for the last few years. He knew I was an orchestra fan," Dr. Hedberg recalls.

"He explained that there was a monthlong tour that fall and he couldn't leave his practice for that long, so would I consider sharing the tour with him.

"I thought about it as long as it took for the light to change from yellow to red," Dr. Hedberg laughs. "Then I said, 'Of course.' "

Since then, Dr. Hedberg has taken nine trips with the orchestra, traveling as far as Australia and as close as San Francisco. The colleague who originally invited him has since left Chicago, and Dr. Hedberg shares his job with another Chicago internist, Marshall Sparberg, M.D.

The two usually split each trip because the symphony tours often last three to four weeks, much too long for a busy doctor to be away from his practice.

On a typical trip, Dr. Hedberg and the musicians, orchestra staff, family members and sometimes trustees travel in the same airplane.

The 17 tons of instruments, equipment and performance attire are usually shipped separately, although, Dr. Hedberg says, small, delicate and valuable instruments are often carried by the musicians. "Of course, Stradivarius violins are always carried," he says.

Included in the 17 tons of equipment is a steamer trunk that orchestra stagehands have constructed to hold medical supplies and to serve as a traveling pharmacy.

The trunk holds 60 or 70 different

"He took the dome off with a great flourish—there was a Fleet's enema."

drugs, ranging from aspirin and antihistamines to antibiotics and medicines for high blood pressure. The Rush pharmacy supplies Dr. Hedberg with unit doses of all medications, so that unused portions can be returned after the trip, similar to the procedure for floor medications in the hospital.

One of the common items now in the trunk wasn't included on Dr. Hedberg's first trip.

"In Brussels, just before we were to leave for a concert, one of the players got into serious trouble with constipation," Dr. Hedberg recalls. "I was new to the job, and I had not taken along any enemas.

"I went down to the concierge in this very elegant hotel and tried to tell him what I wanted," he explains. "I did a little pantomime and he seemed to get the message.

"I went back to the room of my suffering compatriot. There was a knock at the door. It was the concierge in full tails, with a napkin over his arm, and a huge silver tray with a dome on top.

"He took the dome off with a great flourish—there was a Fleet's enema.

"I think that player was the most grateful patient I've ever had."

On a trip to Berlin, a musician forgot his insulin syringes. Since European syringes are calibrated differently, it was important to obtain American ones to ensure the proper dosage.

"My wife, Junia, who is a great help on these trips, reminded me that there was an American military hospital in Berlin," Dr. Hedberg says. "We had to go through about an hour of security—they had to be sure we weren't drug users looking for needles. Finally, I threatened the corporal, 'I'm going to call (then) Senator Charles Percy of Illinois in Washington, if I can't get what I need.'

"We finally got in to see the commanding officer, who turned out to be a great music lover and knew all about the Chicago Symphony," he says. "He wound up at the concert that night… and I got my syringes."

Needless to say, syringes were added to the supply list.

Medical problems on tour include

Dr. Hedberg prescribes medication to Chicago Symphony trombonist Charles Vernon.

routine upper respiratory infections, stomach upsets, traveler's diarrhea and other such minor illnesses. But with an orchestra whose members include people in their 60s and 70s, other problems can occur. Dr. Hedberg recently added the world's smallest electrocardiogram machine to his supplies.

"Sometimes people get mild chest pain, sometimes heart medications need to be adjusted," he says. "And some people just want a little checkup, so I take this machine along."

Dr. Hedberg accompanies the orchestra wherever they go, carrying a black bag with instruments, bandages and a small supply of common medications, such as decongestants and diarrhea medicine. Office hours are held backstage before rehearsals and concerts, and house calls are made in the hotels as needed.

But it is also common for him to treat players in hotel lobbies, in airports and train stations, at receptions and even in museums.

"There's not much that can happen on a trip that I can't handle just like I do in my own office," he says. "But about once every other trip somebody gets very sick and has to be hospitalized."

On the recent trip to Salzburg, a musician's child suffered a convulsion and fever, and had to be rushed to a hospital. A musician developed pancreatitis and was hospitalized in London. And a musician's wife with a long, deep cut in her leg had to be taken to an emergency room in Tokyo.

To prepare for such worst-case scenarios, prior to a tour Dr. Hedberg makes contact with English-speaking doctors in whatever countries the orchestra is going to, and lines up the names of the best hospitals should an emergency room be needed. An exception to this plan occurred on the symphony's trip to the Soviet Union in 1990.

"Our contacts in the State Department advised us not to use the hospitals in the Soviet Union—they were substandard," Dr. Hedberg says. "So the orchestra arranged for a service that guaranteed evacuation by air ambulance in case of emergency. And we took two doctors along on that trip in case one had to go with the patient. Luckily, it didn't happen.

"Most of the time things are routine, but you have to be ready to spring into action," he says.

"For me, compared to what I do in Chicago, it's a vacation, because I spend just a few hours a day at it. And I get some time in the mornings and afternoons to go sightseeing and to visit with the wonderful people in the orchestra."

A lifelong music lover and symphony subscriber since the 1960s, Dr. Hedberg has been attending Chicago Symphony

Daniel Barenboim, music director of the Chicago Symphony Orchestra, conducts a rehearsal in Madrid.

concerts since his mother began taking him at the age of 10.

"Can you imagine hearing Bruckner's massive Seventh Symphony five times in two weeks?" he says. "You get so you feel like you can almost conduct the piece.

"I love that because I'm interested in the detail of music. You know, in a lifetime of going to a concert hall you may only hear some of these pieces three or four times–three or four times in a lifetime of listening to music–heck, I've done that in a week."

Besides being a music lover, Dr. Hedberg is a Bulls and Cubs fan, and he compares the musicians to his heroes of the basketball court and baseball field.

"When I took this job, friends told me, 'They're artists, they're going to be very temperamental,'" he says. "Nothing could be further from the truth.

"They play hurt. They're used to working with aches and pains, and if it gets so they get sick enough that they can't play, they're very upset.

"On one trip, an oboe player developed a serious bronchitis with a temperature of 102. He was coughing constantly, and he told me that the solo he had to play that night was the longest in the oboe literature. I said, 'I don't see how you can do it with this,' and he said, 'I have to.'

"And he went out and he did it. He played it beautifully and he didn't cough a single time.

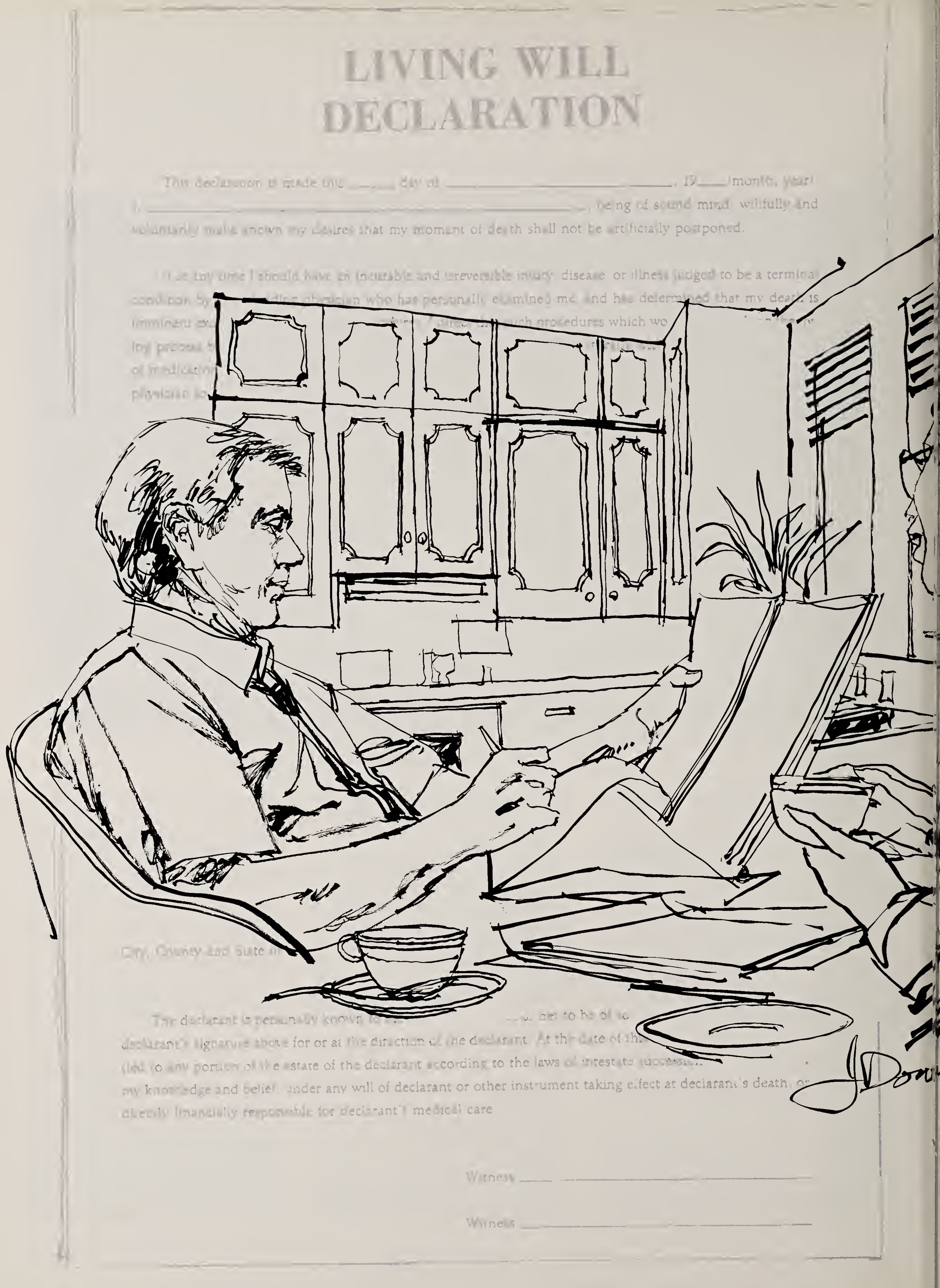
"Another player made an entire trip with a broken arm. He broke it two days before the orchestra left. It's mind over matter, I guess. Everybody wants to play so much. They're going to great halls around the world, and they're at the peak of their careers.

"If they play sick and play with broken arms, you can imagine that they don't let the chronic musculoskeletal problems that musicians get bother them much."

On Dr. Hedberg's one domestic trip with the orchestra, to the West Coast, the musicians arrived but their instruments and performance wardrobe did not. Musicians from the San Francisco Symphony rushed to the hall carrying their instruments to lend to their colleagues.

"Suddenly, I had a public health question," Dr. Hedberg recalls. "Should you play someone else's instrument? We ascertained that in most instances it was okay. They came out and played Beethoven's Fifth, the orchestra in T-shirts and sneakers," he says.

"You know, the thing that impresses me the most about this group is the professionalism. Professionals will do the very best regardless of the cirumstances: Whether they have their formal clothes or not, whether they feel good or not, they want to perform." ⓤ



LIVING WILL DECLARATION

This declaration is made this _____ day of ______________________, 19___ (month, year)

I, ______________________________________, being of sound mind, wilfully and voluntarily make known my desires that my moment of death shall not be artificially postponed.

If at any time I should have an incurable and irreversible injury, disease, or illness judged to be a terminal condition by ... physician who has personally examined me and has determined that my death is imminent ex... such procedures which wo...

ing process b...

of medication...

physician ...

City, County and State of ...

The declarant is personally known to ... her to be of so...

declarant's signature above for or at the direction of the declarant. At the date of th...

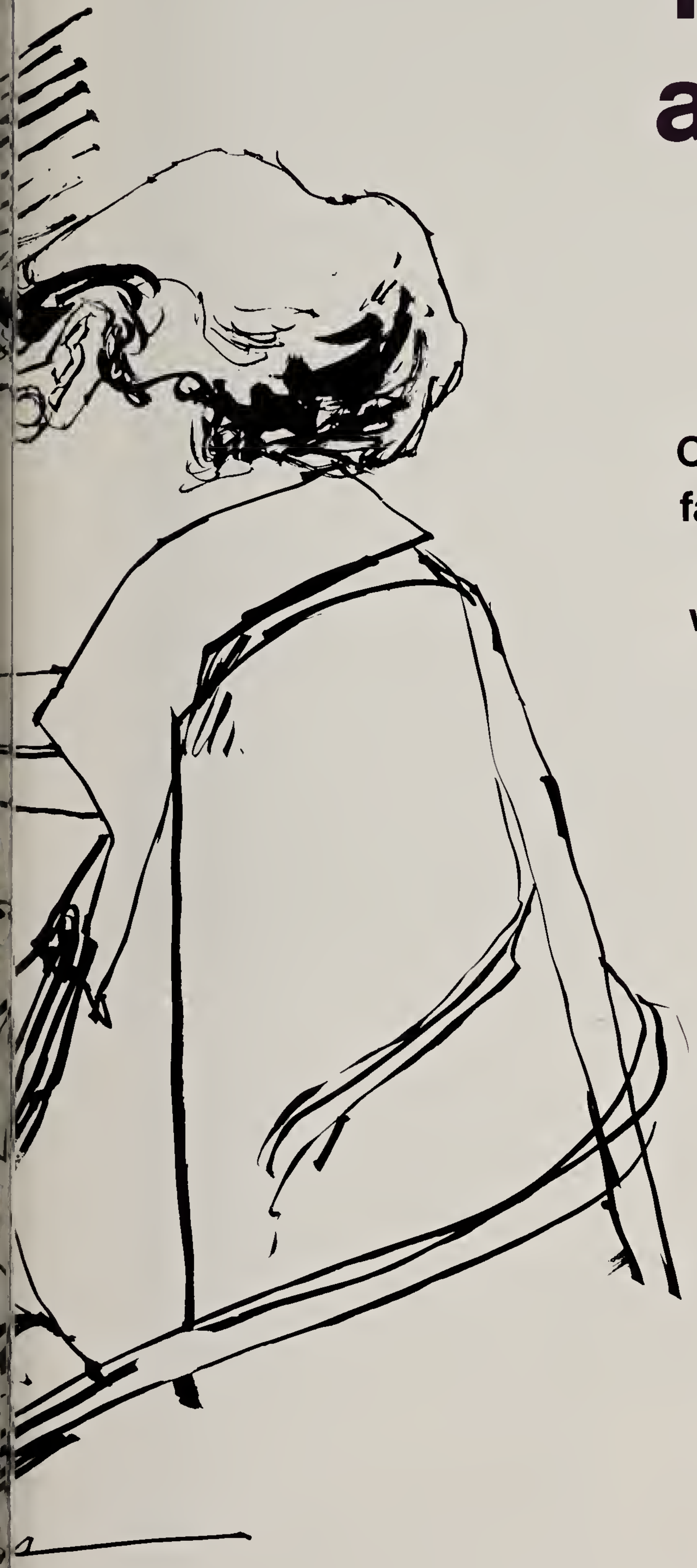
tled to any portion of the estate of the declarant according to the laws of intestate successio...

my knowledge and belief, under any will of declarant or other instrument taking effect at declarant's death, or

directly financially responsible for declarant's medical care

Witness ______________________________

Witness ______________________________



Taking Control of Life and Death Decisions

Chaplains help patients, families and health care professionals wrestle with treatment choices.

by Carolyn Reed

"A lot has changed in health care since the early days of hospital chaplaincy," says the Reverend Larry Burton. "And the changes are not just in terms of high technology and new drugs.

"What's changed is how all of us—doctors, nurses and chaplains—relate to patients and how they relate to us. Gone are the days when we knew what was good for patients and told them what to do.

"Today we ask if a patient wants our services, we seek to engage in conversation, and we do a lot of listening."

Laurel A. Burton, Th.D., is an ordained United Methodist minister, a certified family therapist and Bishop Anderson Professor and chairman of the Department of Religion, Health and Human Values at Rush. He is also editor of a best-selling book on the profession, *Chaplaincy Services in Contemporary Health Care*, published by the College of Chaplains, Inc., and the American Hospital Association.

According to Dr. Burton, despite the shift from paternalism to patient autonomy, hospital chaplains are working closer than ever before with patients, their families, doctors and nurses.

Part of the reason is because so many decisions about treatment of critically ill patients have moral implications.

"Patients and families are very concerned not just with what can be done, but what ought to be done. That's a moral question," Dr. Burton says.

ISSUES IN HEALTH CARE

Laurel A. Burton, Th.D., talks with Rush nursing students about ethical issues facing today's health care professionals.

"Doctors and nurses are also concerned about doing the right thing. And sometimes patients, their families, doctors and nurses are at odds over what to do. They can't seem to hear each other.

"Chaplains are well trained to mediate these conversations. They can help people sort through their values and engage in moral reflection."

Late last year a new federal law took effect which also has affected chaplains' contact with patients and staff. The new law raises issues of life, death and dying for all patients, not just those who are critically ill.

The Patient Self-Determination Act became law December 1, 1991. It requires that hospitals, like Rush, and other large health care providers—nursing homes, HMOs and hospices—ask adult patients upon admission if they have an advance directive and note that fact in the patient's record.

An advance directive is a written document that indicates the type and amount of treatment a patient wants, should that patient become unable to express his or her treatment wishes.

Educating Health Professionals

Dr. Burton's department—working closely with the Medical Center's Office of Legal Affairs—has spearheaded the effort to educate nurses and physicians at Rush about the new law and its ethical implications. Seminars and in-service programs have been held. Detailed guidelines were written for staff, addressing common questions and concerns. A patient information packet was prepared to use in the admitting office.

Through the department's Ethics Consultation Service, faculty members are available to consult with patients and staff when the inevitable questions come up.

"Most patients don't have an advance directive," says Dr. Burton. "Many have never heard of it, much less thought about what their wishes would be."

However, patients are not uninterested in the topic.

In a survey completed just prior to

Illinois Law Goes Further

In Illinois, the Health Care Surrogate Act covers patients who have no advance directive, allowing a surrogate decision-maker to be named—without going to court.

The act is the direct result of an incident which occurred at Rush in April 1989.

At that time, 15-month-old Sammy Linares was surviving on a ventilator in a “persistent vegetative state.” He was not brain dead but permanently unconscious with significant brain damage. Sometimes he appeared to be awake.

A new state law allows a surrogate decision-maker to be named for patients without advance directives.

In the middle of one night his father entered the room with a gun, disconnected Sammy and waited for him to die.

At the time, Illinois law required that family members obtain a court order to withhold or withdraw medical treatment from a patient.

Linares was arrested and charged by the State’s Attorney’s Office with murder. However, when a grand jury failed to indict Linares, then State’s Attorney Cecil Partee formed a task force to look at the issue of removing life support from incompetent patients, such as children and permanently unconscious adults.

Three Rush staff members served on the Partee Task Force: Max Douglas Brown, J.D., vice president for legal affairs; pediatric nurse Teresa Anne Savage, M.S., R.N.; and Jacob Fox, M.D., chairman of neurological sciences and director of the Rush Alzheimer’s Disease Center.

The Partee Task Force final report resulted in the Health Care Surrogate Act.

The act applies in situations where a patient—adult or child—is unable to communicate and has no advance directive, but does have at least one of three qualifying conditions: the patient is terminally ill, permanently unconscious, or in an incurable or irreversible condition where continued treatment will cause pain.

Under these circumstances, a surrogate decision-maker may step forward and choose, on behalf of the patient, to forgo life-sustaining treatment.

The law specifically lists potential surrogates, in order of priority: 1) the patient’s personal guardian; 2) the patient’s spouse; 3) any adult son or daughter; 4) either parent; 5) any adult brother or sister; 6) any adult grandchild; 7) a close friend; 8) the patient’s guardian of the estate.

As the legislation sat on Governor Edgar’s desk in the summer of 1991, Rush chaplain Larry Burton, Th.D., Brown and Rush Ethics Consultation Service director Russell Burck, Ph.D., wrote a strongly worded *Chicago Tribune* opinion piece urging the governor to sign it.

They stressed how important the bill was in terms of clarifying who makes treatment decisions for those patients who don’t or can’t have an advance directive (such as infants and children).

Dr. Burton now notes, somewhat ruefully, that the state law can work at cross-purposes with the federal Patient Self-Determination Act.

“Some people will say to themselves, ‘I don’t have to think about making end-of-life decisions because the doctor can just appoint a surrogate for me.’

“At the same time, physicians might say, ‘I don’t have to bring up these issues because we in Illinois have the Health Care Surrogate Act.’

“I can understand that kind of reasoning, but I don’t agree with it,” Dr. Burton says. “We who are competent adults should make our wishes known and not make our loved ones guess.”—*C.R.*

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the law’s implementation, Dr. Burton and his research colleagues found that despite their limited knowledge about advance directives, patients were willing, even eager, to discuss them with various health professionals, in particular doctors, nurses, clergy, social workers and psychologists.

“We are following up on that original poll, to see if the new law has increased use of advance directives.”

A second study is under way to determine if patients who have a conversation with a doctor on this issue are afterward more likely to execute an advance directive.

“Coming into a hospital confronts you with your mortality in a variety of ways,” says Dr. Burton. “It can leave you feeling very powerless. As chaplains we want patients to have a sense of ‘enough power.’ Not to be bossing doctors around—any more than we want doctors bossing patients around—

but to be able to be partners in their treatment, and to be able to have a voice and be heard.

"Having an advance directive is one way to be heard."

Rush general counsel Max Douglas Brown, J.D., notes that in Illinois, two forms of advance directive are recognized as valid.

"The Living Will is used to indicate a patient wants care withheld or withdrawn if he or she is unable to communicate and is terminally ill," says Brown, who is also vice president for legal affairs and associate professor of religion, health and human values.

> ***"The issue here isn't about the right to die. The issue is self-determination. That involves the exercise of power when you're still very much alive…"***

"The Durable Power of Attorney for Healthcare is more flexible about the type and amount of care a patient may receive under various circumstances, when the patient cannot communicate. It allows the patient to designate an agent who will make decisions on his or her behalf."

A patient can have both types of advance directive, but Brown says many lawyers recommend the durable power of attorney because it gives the person you name as your agent broad power to make decisions.

"Of course, it's important you trust that person and that he or she knows your values and wishes well."

In the case of either a living will or a durable power of attorney, it's up to physicians to determine if the patient's medical condition meets the requirements for invoking the advance directive.

The new law does not require a person to have an advance directive.

As with an ordinary will, a living will or durable power of attorney can be revised or revoked by the patient at any time.

Since the new law took effect, Dr. Burton's department and the Office of Legal Affairs have been monitoring the staff's experience. Just because a patient has an advance directive and this fact is indicated in the chart doesn't eliminate all confusion.

Dr. Burton recalls one case he became involved in.

"The doctor thought he should have the patient's designated agent make a treatment decision, but he wasn't sure. It turned out that even though the patient was very sick, he could still communicate by nodding. In other words, the patient was still competent and could make his own decisions.

"Another common concern we get called about is how to deal with family members who contradict what the advance directive indicates is the patient's wish."

Dr. Burton uses those examples to underscore how important it is for doctors—and family members—to know what's in a patient's directive and to be clear about when to use it.

But isn't end-of-life decision-making essentially a legal matter?

"We all have certain values that undergird our decisions, but not everyone is always clear about what these values are or why they hold them," Dr. Burton says. "A major role we perform as chaplains is as translators or interpreters of these values.

"Not everyone calls himself or herself 'religious' but we are all in our own way 'spiritual.' Human beliefs and values—what some call faith—are integral parts of the experience of illness and healing."

Defining Values

Yet for all his department's involvement in this issue, Dr. Burton suggests that the hospital is not the best place to begin thinking about 'How do I want to be cared for should I become incapacitated?' or 'Who do I want designated to direct my care in the event I cannot?'

Ideally, these issues should be addressed long before the patient enters the hospital.

"The offices of our family physicians and nurses, and our churches or synagogues are the places where these discussions should begin," says Dr. Burton.

He has urged as much in articles that have appeared in *Hospitals* magazine, *Trustee* magazine, and *Illinois Medicine*, as well as in talks with Rush staff.

Since January, the Chicago Institute of Medicine, the Illinois State Medical Society and the American Medical Association all have produced comprehensive educational materials to help doctors, patients, clergy and others in talking about advance directives.

The availability of such material, however, doesn't necessarily translate into action.

"In my contacts with churches and synagogues about leading programs on end-of-life decision-making, I still sense a good deal of ambivalence," Dr. Burton says.

"Perhaps they're afraid they'll scare people, but my experience has been that talking diffuses anxiety. It puts people more closely in touch with their families and their fundamental beliefs.

"The issue here isn't about the right to die. The issue is self-determination. That involves the exercise of power when you're still very much alive and well."

Rush nurses leave from Midway Airport to help colleagues in hurricane-damaged Florida.

Rush Nurses Pitch In at Florida Hospital

Just south of Miami, riding on U.S. Route 1, what they saw resembled a war zone. Not a tree was standing. The homes looked like dollhouses, fronts ripped off, with the furniture still inside.

Twelve Rush nurses viewed Hurricane Andrew's devastation from their seats in a Doctors' Hospital van. One week after the storm, they'd flown in to work four days at the 200-bed Coral Gables facility, providing relief for the nursing staff. Many of the Florida nurses had damaged homes to attend to. Others had no place to live.

The Rush nurses pitched in wherever they were needed—on the maternity floor, the medical/surgical floor and in the emergency room. So did family and friends.

"One couple's children helped out on the floor," said Sally Evankoe, M.S., R.N., assistant unit leader. "She was a nurse, he was a security guard, and their son ran errands while their daughter answered the phone." The family had lost their year-old home and all their belongings.

"It was wonderful the way the hospital accommodated everyone," said Carmen Acosta, R.N., labor and delivery. "They opened a day care center so employees could bring their kids."

Some children, however, needed special attention. Labor and delivery nurses Karen Buhle, R.N., and Joyce Strohman, R.N., took turns babysitting the two traumatized preschoolers of an O.B. technician. The family had endured four hours huddled under a mattress, inside their boarded-up house the night of the storm. "I think they were still scared," said Strohman. "It happened on the older girl's birthday."

A Sears corporate jet flew the nurses to and from Florida. (Sears chairman Edward A. Brennan is a Rush trustee.) The Medical Center covered their salaries, while nursing colleagues put in extra time to cover for the volunteers.

Would they do it again? "In a minute," said Evankoe. "We could've easily sent four planeloads, so many Rush nurses wanted to go."

Added Acosta, "I just hope everyone realizes the people of south Florida are going to need help for a long time." —*C.R.*

New Test Helps Fight Against AIDS

A Rush study has found that a new, simple test is effective for counting CD-4 lymphocytes, a type of immune cell. In AIDS patients, CD-4 counts indicate stage of illness—information helpful in choosing and measuring the effectiveness of treatments.

The standard technique for counting CD-4 cells requires expensive equipment, a trained technician and electricity. The new test provides comparable results using just a microscope and a hemocytometer, an inexpensive device that counts cells.

"With this test, we can determine how well someone's immune system is working practically anywhere—even in the jungle. This will be valuable in developing nations, such as those in Africa, where AIDS is prevalent," says Alan Landay, Ph.D., the Rush immunologist who led the study. —*C.J.*

Denver Hospital Is 'Western Campus' for Rush

Rush has signed an affiliation agreement with a teaching hospital in Colorado—creating, in effect, a western campus for residency training and graduate education.

The agreement allows Rush to send residents on training rotations to Presbyterian/St. Luke's Healthcare System in Denver, Colorado's largest health care provider.

Arrangements have been made for rotations in internal medicine, general surgery, obstetrics and gynecology, and family medicine. Talks are under way to develop similar programs in anesthesiology and pediatrics.

The affiliation contract also allows for collaborative efforts in continuing education, nursing education and clinical research.

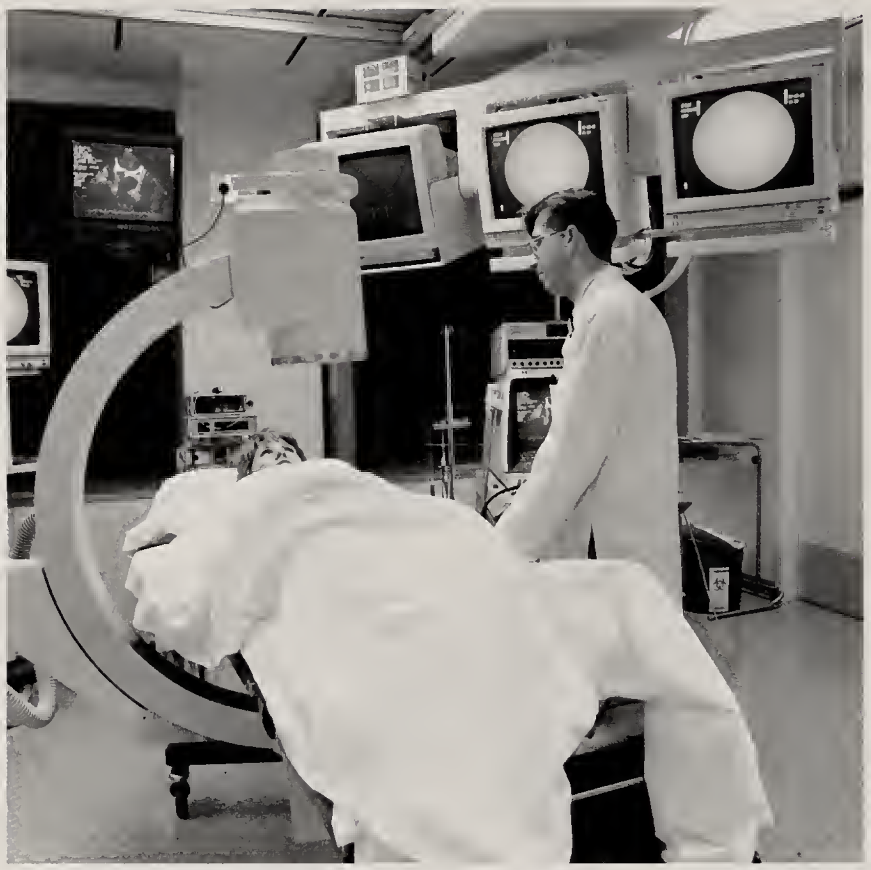
Erich E. Brueschke, M.D., vice dean of Rush Medical College, heads the project steering committee. David H. Eubanks, Ed.D., director of the Division of Education and Research in the college, is coordinator of the project.

"No one's ever attempted this kind of academic affiliation, where there are 1,000 miles between the institutions involved," said Dr. Brueschke. "But we think we can make it work."

In addition to its main campus, the Presbyterian/St. Luke's system includes an affiliated hospital in nearby Aurora, Colorado, and an ambulatory care facility.

Thomas Petty, M.D., president of Presbyterian/St. Luke's Medical Center for Health Sciences Education, has been named an associate dean at Rush.

The first Rush resident, Andrew Blair, M.D., went to Denver in July to begin his fourth year of training. —*C.R.*



The Rush Center for Critical Care Medicine is one of the best-equipped in the Midwest.

Center Offers High-Tech Approach to Critical Care

Rush has opened a new 55-bed Center for Critical Care Medicine, which brings together all of the nonsurgical adult intensive care services at Rush. The center houses sophisticated instruments available at only a few hospitals in the Midwest.

The Jet ventilator, for example, can support the breathing of patients with the most severe respiratory ailments. Sensitive monitors—the most advanced models—track and record up to 10 vital signs at a time. Using transesophageal echocardiography, an ultrasound probe can be placed down a patient's esophagus to obtain detailed pictures of the heart, all without the need for an incision.

But it's the people who work on the unit, not the equipment, who ensure the finest patient care, says Joseph Parrillo, M.D., the James B. Herrick, M.D., Professor of Heart Research and director of the new center.

"Critical care requires a team effort as much as—or perhaps more than—any other field of medicine," says Dr. Parrillo. The center's multidisciplinary staff includes cardiologists, pulmonary specialists and critical care nurses. Together, they work to establish the best treatment plan for each patient.

Clinical research is another factor that makes the center unique, he says. Patients who don't respond to conventional therapies may benefit from experimental medications and innovative technologies—treatments that aren't yet widely available.

Research at the center also will address quality of life issues, such as how to care for critically ill patients who can't be helped even with innovative treatments.

"Most of the time we make patients better. But in some cases, the best we can do is help a patient die with dignity," says Dr. Parrillo. "That's what research is really about—providing not only the finest patient care, but also the most compassionate."—*C.J.*

ArcVentures Goes International

ArcVentures, a for-profit subsidiary of the Medical Center, has gone international—to Manila—where it is offering a preparatory course for the U.S. Medical Licensing Examination.

The subsidiary's Medical Education Services division added the Philippine capital to the list of four cities—Chicago, Los Angeles, Miami and Hasbrouck Heights, New Jersey—where it provides courses for students preparing for the medical boards.

More than 5,000 students have enrolled in the course since it was first offered in 1988.

"There have been a lot of opportunities for us to go international, but this was the best," says Tamra Heberlein, director of new product development and marketing.

The project represents a joint working relationship between ArcVentures and a Manila-based employment placement service.

The 10-week course, which enrolled 30 Philippine students this year, will be offered again in Manila in the spring of 1993. According to Heberlein, the next few years will see stepped up marketing efforts by ArcVentures in the Pacific Rim.—*S.P.F.*

Speaker Looks to Future of U.S. Health Care

In his address at Rush University's commencement June 13, noted health care economist Stuart H. Altman, Ph.D., discussed the future of the U.S. health care system, stressing the need to trim costs and provide coverage for the millions of uninsured Americans.

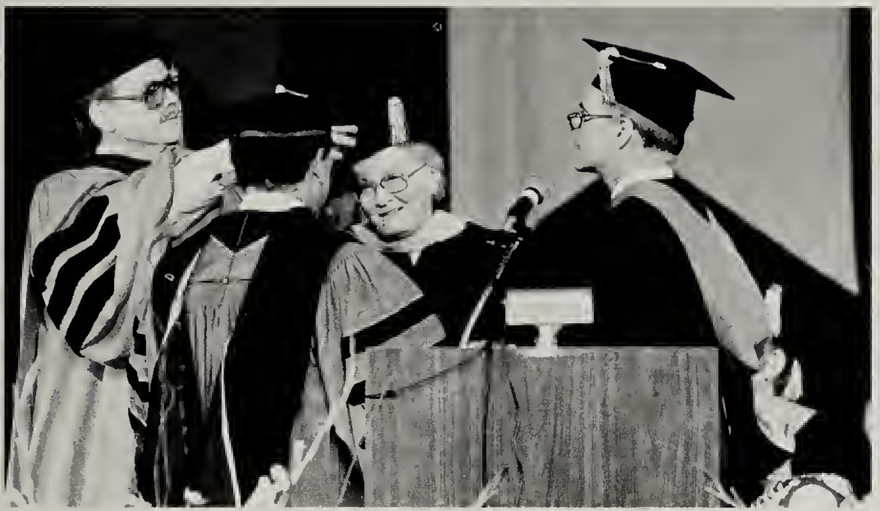
"The anger that some of your fellow citizens show towards our health system is not directed towards you and your colleagues," Dr. Altman told the graduates.

"We need you. But we are afraid. We are afraid that when we need your services and the high-cost technologies that you use, we will not have the money to pay for it. And the health insurance we counted on to protect us will not be there.

"But looking at all of you today, I am confident that with your help, we will do the 'right thing,'" he said.

Dr. Altman, who is dean of the Florence Heller Graduate School at Brandeis University, received an honorary doctor of humane letters degree at the ceremony.

Rush University conferred 316 degrees at commencement. These included 106 doctor of medicine, 13 doctor of nursing science, 19 doctor of nursing and 6 doctor of philosophy degrees. The master of science degree was earned by 82 graduates, 51 in nursing and 31 in allied health fields—audiology, clinical nutrition, health systems management, occupational therapy and speech-language pathology. The bachelor of science degree was conferred on 90 graduates, 81 in nursing and 9 in medical technology.—*B.H.*



Ruth Schmidt, R.N., receives her award from vice-chairman of the Board of Trustees, Marshall Field. Leo Henikoff, M.D. (center), and Laurel H. Burton, Th.D. (left), lend a hand.

Four Trustee Medals Awarded at Commencement

Trustee Medals for 1992 were awarded to John P. Bent, John S. Graettinger, M.D., Ruth E. Schmidt, R.N., and Edward Foss Wilson. The medals were presented at Rush University Commencement in June.

Trustee Michael Simpson cited Bent, a life trustee since 1976, for 44 years of hands-on trusteeship.

As St. Luke's Board chairman, Bent helped orchestrate the 1956 merger with Presbyterian Hospital. From 1962 to 1964, he served as the first president of Presbyterian-St. Luke's Hospital.

Bent and his wife were honored for their support of the Medical Center by the establishment of the Mary and John Bent Chair of Cardiovascular-Thoracic Surgery.

Dr. Graettinger, now an emeritus professor of medicine at Rush, played a key role in the reactivation of Rush Medical College.

As dean of student and faculty affairs, Dr. Graettinger planned the first Rush University commencement in 1973. He was university marshal for 19 years, before retiring this year.

Schmidt received her award from trustee Marshall Field. A 1934 graduate of Presbyterian Hospital School of Nursing, Schmidt was formerly director of the Operating Room at Rush.

She established an endowment in her name to help registered nurses complete their education at the Rush University College of Nursing. In tribute to her physician, James G. Clark, M.D., she also established an endowment for medical students.

Wilson, a life trustee, received the fourth award. "With service to the Medical Center spanning six decades, he knows the true meaning of voluntarism," said Field. The Washington, D.C., resident has often traveled almost 2,000 miles round-trip to attend board meetings.

A founding member of the Anchor Cross Society, Wilson and his wife are members of the Board of Benefactors.—*B.H.*

John S. Graettinger, M.D., with his grandchildren.

John P. Bent

Edward Foss Wilson

Nora Paulford, M.S.N., R.N. (center), discusses patients with staff nurses.

Nursing Officers Elected

Nora Paulford, M.S.N., R.N., has been elected president of the 1,350-member Professional Nursing Staff at Rush.

Paulford succeeds Margaret Waskiewicz, M.S., R.N., who now will serve a one-year term as past-president. Other new officers are Teresa Anne Savage, M.S., R.N., president-elect; Gia Crisanti, R.N., secretary; and Elizabeth A. Rochford, R.N., treasurer. New officers began their terms on July 1.

Paulford, an assistant unit leader in operating room/surgical nursing, has been a member of the Rush staff for three years. She received her bachelor's degree in nursing from the College of St. Scholastica in Duluth, Minnesota, and her Master of Science in Nursing degree at Loyola University of Chicago.

The Professional Nursing Staff is a voluntary organization committed to maintaining the quality of nursing care, education and research at the Medical Center.—*S.J.*

Teresa Anne Savage, M.S., R.N., helps other nurses handle the ethical issues they face on the job.

Rush Nurse Is Number One in the State

After two decades working with sick newborns and children with developmental disabilities, Teresa Anne Savage, M.S., R.N., knows firsthand how often nurses face ethical issues on the job. She's been striving for the past 10 years—through sensitive patient care, writing and teaching—to be a resource for other nurses caring for critically and terminally ill people.

This past spring, her efforts were recognized when she was named the Illinois winner of the 1992 Search for Excellence Award by the American Nurses Association.

"Her work with developmentally disabled children and their families shows how nursing makes an impact. She has been a leader in defining nursing's role in ethical decision-making," said Jeanne Slack, D.N.Sc., R.N., associate chairperson of maternal-child nursing, who nominated Savage for the award.

Savage was one of two nurses on a commission whose recommendations led to the recently enacted Illinois Health Care Surrogate Act. The act allows surrogates to speak on behalf of patients who have not executed advance directives on withholding or withdrawing life support.

A practitioner-teacher in the neonatal intensive care unit at Rush, Savage also is an ethics consultant in the Department of Religion, Health and Human Values. She is pursuing a doctoral degree in nursing ethics at the University of Illinois at Chicago.

"I want to teach nurses how to evaluate ethical issues, and to work as part of a health care team to identify treatments that respect the values of patients and their families," she says.

"A lot of times, you question if you're doing the right thing. Understanding ethical issues can only improve your nursing judgment."—*S.P.F.*

Erich E. Brueschke, M.D.

Brueschke Elected Vice Dean of Rush Medical College

Erich E. Brueschke, M.D., has been elected the first vice dean of Rush Medical College by the Medical Center Board of Trustees. In a related action, president and CEO Leo M. Henikoff, M.D., has appointed him associate vice president for medical affairs.

Dr. Brueschke came to the Medical Center in 1976. For the past 15 years, he has directed the integrated residency program in family practice at Rush and at Christ Hospital and Medical Center, Oak Lawn.

As vice dean of Rush Medical College, Dr. Brueschke will perform special duties and functions delegated to him by Roger C. Bone, M.D., dean of the college and vice president of medical affairs. He will serve as the dean when Dr. Bone is absent or unavailable.

Dr. Brueschke earned his medical degree at Temple University, and took postdoctoral training at Germantown Dispensary and Hospital in Philadelphia.

He is the author of more than 80 published papers in his field and is medical editor of the best-selling *World Book Rush-Presbyterian-St. Luke's Medical Center Medical Encyclopedia.*

He holds two patents in biomedical engineering and has research interests in biomedical and clinical engineering, reproduction, hypertension and education.

Said Dr. Bone, "Dr. Brueschke's versatility and superb organizational skills, along with the respect he has earned as a teacher, administrator, clinician and researcher, will be an important resource in the continued advancement of the programs of Rush Medical College."—*C.E.*

Elderly patients have a better frame of mind about surgery after "reminiscence interviews" conducted by their peers.

Reminiscing Helps Ease Stress of Surgery

Remembering the good times can help ease elderly patients' anxiety in the face of surgery.

Traditional stress management techniques, such as controlled breathing and muscle relaxation, are often successful with young and middle-aged patients. But their effectiveness with older people has been limited, says Bruce Rybarczyk, Ph.D., assistant professor of psychology and social sciences.

"Older patients sometimes view the use of these techniques as indications that the staff think they are not coping well," he says. "They often decline these techniques when they are offered or may become defensive to the point where exercises are no longer beneficial."

But Dr. Rybarczyk has found that these same patients are often receptive to pre-surgery interviews, called reminiscence interviews, that focus on positive life experiences and challenges they had successfully met.

In a recent study, Dr. Rybarczyk trained volunteers to conduct the interviews with elderly patients just prior to surgery.

The interviewers—themselves all at least 50 years old—acted as peer counselors. They talked with patients about such things as their families, childhood friends, triumphs, the Great Depression, first loves, jobs and wartime.

"Patients who participated in reminiscence interviews were less anxious before and during surgery, had more confidence about their ability to cope with challenges than those who received no stress intervention, and were more satisfied with their hospital care." says Dr. Rybarczyk.

One woman who had been interviewed said, "It was wonderful to take my mind off the operation coming up that afternoon. It made me feel much better to talk to someone about things that brought back so many memories.

"It was a better way to spend the time than having someone sitting there saying, 'You're going to be fine,' when I was so worried."—*P.R.*

Study Seeks Prevention for Breast Cancer

As headlines tell of alarming increases in breast cancer rates, American women have become more vigilant about performing breast self-exams and scheduling mammograms. But while these methods are vital for detecting early signs of disease, they are only chinks in cancer's armor. The best defense against cancer would be an effective preventive measure.

That's the thinking behind the Breast Cancer Prevention Trial, a $60 million, five-year study now under way at some 270 sites—including Rush—in the United States and Canada. The study is testing whether tamoxifen, a potent synthetic anti-estrogen hormone, is effective in preventing breast cancer. Tamoxifen is routinely used to treat advanced breast cancer.

The study is enrolling 16,000 women who don't have breast cancer but are at high risk for developing it. Rush will enroll 200 over the next 18 months. Half will be given a daily dose of tamoxifen and the other half a placebo, for at least five years.

"In studies of women who have had breast cancer, tamoxifen appears to inhibit the development of tumors in the other breast," says Janet Wolter, M.D., professor of internal medicine and principal investigator for the project at Rush. "But this is the first time tamoxifen has been tried in women without the disease," she says.

Researchers will try to find out how common tamoxifen's adverse side effects are. These include hot flashes, vaginal discharge and, in rare cases, blood clots. The drug also has some beneficial side effects. It lowers cholesterol levels and seems to slow the bone loss known as osteoporosis.

Any woman age 60 or over is eligible to participate in the study. Breast cancer occurs most often in that age group.

Women between the ages of 35 and 59 who have been diagnosed with noninvasive breast cancer, called lobular carcinoma in situ, are also automatically eligible.

Other women in that age range may qualify based on a combination of risk factors: having a mother, sister or daughter with breast cancer; having a history of one or more breast biopsies; being older than 30 at the birth of her first child; and menstruating before the age of 12.

Women interested in the trial can call the Rush project at (312) 563-2057, or the National Cancer Institute hotline at 1-800-4-CANCER. There are 13 study sites in the Chicago area.—*C.R.*

Everything Old Is New Again

Yesterday's news is making headlines at Rush. The Medical Center is now using bedpans and urinals made from recycled newspapers and telephone books.

These single-use, biodegradable utensils—with their dark gray color and egg carton-like texture—may not be pretty but they work just fine. Beeswax keeps them waterproof.

Now, instead of emptying and sterilizing a used bedpan, hospital personnel can throw the item into a disposal unit that drowns it in cold water, shreds it and flushes it down the drain.

"The purchase cost of these materials, the disposal cost and the labor cost, in terms of time and dollars, are all reduced," says Steven Beaudoin, director of occupational safety.

Done with that sports section, yet?—*S.J.*

A Rush medical student cares for a patient at St. Basil's Free People's Clinic.

Building a Community Service Network

Medical students from Illinois and Wisconsin came to Rush last April to talk about volunteer programs that get them out of the classroom and into the community.

Over the years, Rush Medical College students have donated their time in a number of programs serving communities near Rush. They've offered health care to people in need, and have taken on such things as tutoring programs for youngsters from low-income families and health education workshops for teenagers.

In one highly successful program, 100 Rush students work with 25 Medical Center physicians to provide medical care at St. Basil's Free People's Clinic on Chicago's southwest side. Rush now offers a weekly general medicine clinic and a biweekly obstetrics and gynecology clinic at St. Basil's.

Rush students hosted the spring meeting to share what they'd learned through these and other similar programs.

"We were feeling overwhelmed by the need we saw in our own community," says Karen Zorek, the fourth-year Rush Medical College student who organized the meeting. "We were also getting so much out of our experiences, we wanted other students to feel the same benefit."

Students at the meeting represented the University of Chicago, the University of Wisconsin at Madison, Chicago Medical School and Chicago College of Osteopathic Medicine. Some of these schools already offered community services, such as visits to homeless shelters. But they didn't have the administrative and physician support that has helped Rush programs along.

"The point of the meeting was to help students work with limited resources, enlist support, maintain momentum for their projects, and discover new approaches to health care," says Claudia Baier, M.P.H., assistant director of the Rush Community Services Initiative Program.

"We invited residents from various Chicago communities to tell students about their needs," she says. "We wanted every school to leave with the name and phone number of at least one person or organization they could call and help."

David Fohrman, a second-year student at Chicago Medical School, was so inspired by his newfound comrades that he contacted medical schools nationwide to find out where other community service programs were under way. Within weeks, he discovered 20 such programs.

With help from Fohrman and Baier, Rush student Zorek plans to start a newsletter to help keep alive the excitement generated by the meeting. Among other things, the newsletter will feature "how-to" articles on establishing community programs. There are plans to expand the local network—using the newsletter and future meetings as tools—to include medical schools from around the country.

Says Fohrman: "Networking may be a vital step in keeping these projects afloat."—*J.H.*

Taking Precautions Against Bedsores

Research shows that pressure ulcers—or bedsores—can often be prevented with simple, inexpensive precautions. But at some institutions, up to one-fifth of patients at risk develop these painful sores.

Mildred Kemp, Ph.D., R.N., OR/surgical nursing, was recently invited to serve on a panel of the U.S. Department of Health and Human Services that drafted national guidelines on preventing and treating bedsores. Dr. Kemp has studied pressure ulcers for more than 10 years.

Pressure ulcers occur when a person's skin presses against bony parts of the body like the hips. "They can ulcerate as far down as muscle and even bone," says Dr. Kemp. "In some cases, the result is an ulcer so severe that it requires surgery."

Studies have shown that sores may be prevented by keeping incontinent patients dry, routinely changing the positions of immobile patients and cushioning patients with pillows or foam. These findings have been incorporated into the new guidelines.

"Through research, we learn to improve patient care," she says. The federal guidelines will help translate research into better care at institutions around the country.—*C.J.*

Illness Prevention: A Primary Concern

Evaluating and treating healthy people to prevent illness—called primary prevention—should be a high priority of medicine, says Henry Black, M.D., the Charles J. and Margaret Roberts Professor and chairman of preventive medicine.

Primary prevention often takes a backseat to what's known as secondary prevention, says Dr. Black. In secondary prevention, physicians work with patients who are already sick to try to avert future problems. For instance, for people who have had heart attacks, physicians often prescribe low-fat diets and regular exercise because they are known to reduce the risk of later attacks.

The benefits of primary prevention strategies are not always so clear, says Dr. Black. "Should physicians recommend estrogen therapy to postmenopausal women to prevent heart attacks? Based on what we know so far—probably," he says.

"But if this were standard practice for everyone, we would treat some people who would develop complications as a result. And we don't know with enough certainty that estrogen will, in fact, prevent anything."

But knowledge about primary prevention is growing, says Dr. Black. For instance, it was previously thought that restricting salt intake was one of the best methods for reducing the risk of high blood pressure. "We now know that for some people, the amount of dietary salt is not that important," he says. "Weight control is more crucial.

"These are the kinds of questions preventive medicine needs to be able to answer. As a major medical center, Rush has a responsibility to develop and evaluate prevention strategies and provide them to people at relatively affordable costs."

Dr. Black, who comes to the Medical Center from Yale University School of Medicine, looks to education and research to kindle future physicians' interest in primary prevention.

"A heart surgeon takes someone who'd be dead in the morning and gives that person a second chance," he says.

"We have to prepare our graduates to feel the same kind of excitement for primary prevention. We have to help them recognize that, for example, if they can help lower a hypertensive patient's blood pressure, heart surgeons won't need to operate on that patient 25 years down the road."—*M.M.*

Trustees Elect Two New Members

Thomas R. Hodgson and John F. (Jack) Sandner have been named general trustees of the Medical Center. Their election was announced by Richard M. Morrow, chairman of the Rush Board of Trustees.

Hodgson is president and chief operating officer of Abbott Laboratories. He joined Abbott Laboratories in 1972 as assistant to the president. Since then, he has held numerous positions in the company, including executive vice president and president of Abbott International, and president of the hospital products division.

He holds a B.S. degree in chemical engineering from Purdue University, an M.S.E. degree in chemical engineering from the University of Michigan, and an M.B.A. degree from Harvard University.

He is a member of Abbott's board of directors and serves on the board of Maclean Fogg Co., a manufacturer of automotive components based in Mundelein.

Sandner is chairman of the Board of Governors of the Chicago Mercantile Exchange, and president and CEO of Rufenacht, Bromagen & Hertz, Inc., a Futures Commission Merchant and member firm of the mercantile exchange.

He received a bachelor of arts degree from Southern Illinois University and earned a law degree from the University of Notre Dame.

He serves on the boards of the Notre Dame Law Association, Mercy Hospital and Medical Center, and the Northern Illinois Council on Alcoholism and Substance Abuse.

Thomas R. Hodgson

John F. (Jack) Sandner

Jan S. Fawcett, M.D.

Fawcett Named to Grainger Chair

Jan S. Fawcett, M.D., the Stanley G. Harris, Sr., Professor of Psychiatry and chairman of the Department of Psychiatry, was named the first Grainger Director of The Rush Institute for Mental Well-Being (see related story, pages 22-27).

The directorship was established earlier this year through the generosity of David and Juli Grainger. David Grainger has been a member of the Medical Center Board of Trustees since 1984, and is a member of the board's executive committee. Mrs. Grainger has been on the Woman's Board since 1985.

The Grainger family's most recent gift reflects their commitment to advancing research and treatment in psychiatry. In addition to the endowed directorship, Mrs. Grainger has made a gift in her name to the Woman's Board Depression Treatment & Research Center.

Dr. Fawcett is world renowned for his research on the biochemical foundations of depression and suicide. A graduate of the Yale University School of Medicine, he came to Rush in 1972 as chairman of the Department of Psychiatry. He is a frequent contributor to scientific journals, president of the American Suicide Foundation and active in many other professional organizations.—*C.R.*

Aspiring medical students get hands-on experience in an anatomy laboratory.

Rush Gives Minority Students a Head Start on Medical School

Undergraduate minority students with dreams of white coats and stethoscopes came to Rush this past summer to participate in the Robert Wood Johnson Foundation–Minority Medical Education Program.

A record number of 43 undergraduate students–ranging in age from 19 to 30 and representing 34 universities–took part in the six-week program, which gives underrepresented minority students firsthand exposure to the intensity of medical school.

The Rush program is part of the 13-year-old Chicago Area Health and Medical Careers Program, a consortium of seven medical schools working together to increase the number of minority students in medical school.

"The summer program is part of a pipeline that is vital to getting minority students from grade school through college interested in careers in medicine, science and health care," says Edward Eckenfels, director of the Robert Wood Johnson program and associate professor of preventive medicine at Rush.

"Our goal is to help minority students become more qualified medical school applicants," he says. "This, in turn, will increase the pool of minority physicians."

The program involved more than six hours a day of classroom and laboratory instruction, workshops and interview sessions.

Rush faculty and staff members taught students the best ways to study and retain basic science information. They led discussions on such topics as AIDS and the pros and cons of the U.S. health care system. Students also observed Rush minority physicians at work in the Medical Center and in the community.

Just as in medical school, there was a lot of homework. "I've been so busy studying that I haven't had time to tour Chicago," said Jeffrey Brock, a senior psychology/premed major at Xavier University of Louisiana.

Brock said he especially benefited from the program's Medical College Admissions Test preparation, exposure to clinical medicine and the medical school admissions information.

"I'm now more confident that I'll get into medical school," he said.–*B.H.*

Boder, Shekleton Are Distinguished Alumni for 1992

Elena Boder, M.D., a 1932 graduate of Rush Medical College, and Maureen E. Shekleton, D.N.Sc., R.N., a 1982 College of Nursing graduate, were named distinguished alumni of Rush University for 1992.

Dr. Boder is a clinical professor of pediatrics at the School of Medicine at the University of California, Los Angeles. She established the Pediatric Neurology Clinic for Language and Learning Disorders at Cedars-Sinai Medical Center in Los Angeles more than 25 years ago and served as director of the clinic for many years.

In the early 1960s, Dr. Boder and her colleague, Dr. Robert Sedgwick, described a rare neurological disorder, ataxia-telangiectasia. This hereditary disease first appears in childhood, with early symptoms including an unsteady gait and a weakened immune system.

Dr. Boder also is world renowned for her work on reading disorders. She is author of more than 65 scientific papers and 19 chapters for textbooks in general pediatrics and pediatric neurology.

Dr. Shekleton specializes in cardiopulmonary nursing. An adjunct assistant professor of operating room and surgical nursing at Rush, Dr. Shekleton is an expert in respiratory and ventilator care. She has published many scientific articles and coauthored two books.

Dr. Shekleton is a past president of the Illinois Nurses Association. The American Nurses Association named her the 1989 Medical/Surgical Nurse of the Year. She received the first combined American Nurses' Foundation/Sigma Theta Tau grant.–*B.H.*

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